North Coast Amateur Radio Club

EMERGENCY COMMUNICATIONS
PUBLIC SERVICE
EXPERIMENTATION
INFORMATION
EDUCATION

P.O. Box 30529
Cleveland, Ohio 44130

Emergency Communications for:
COUNTY OF CUYAHOGA
Div. of Emergency Assistance & Planning

Not for profit Ohio corporation tax-exempt under IRS Section 501(c)(3)

CODE PRACTICE
SUNDAYS 8 PM
145.29
6,9,13,16,20 & 24
W.P.M.

North Coast Communicator

INFORMAL NETS
SUNDAYS 9 PM
145.290
SATURDAYS 10 AM
28.40

JUNE / JULY - 1987

Board Meeting Notice 6:00 PM Thursday July 2, 1987 at Denny's Restaurant, 25912 Lorain Road, N. Olmsted (between Great Northern & Brookpark).

General Meeting Notice 7:30 PM Thursday July 2, 1987 at the N. Olmsted br. of the Cuyahoga County Public Library, 27425 Butternut Ridge, (South side next to N. Olmsted Middle School between Dover Center & Lorain).

WELCOME NEW NORTH COAST A.R.C. MEMBERS

Help give a warm welcome to the following new members since the April/May issue. KB8BBU Jerry, KB8BNC Ron, W8CDL Dave, WB9GMO Mike, Donna Pearl and Michele Tews. NCARC membership is now at 233. An up-to-date NCARC roster is enclosed within this issue of the Communicator.

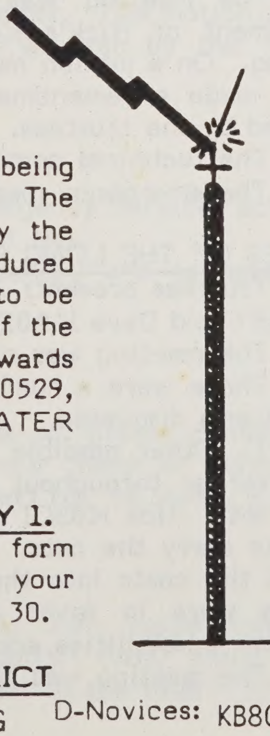
CONGRATULATIONS TO NCARC MEMBER WHO RECENTLY UPGRADED

N8ILL (ex KB8BBT) Mary Lou fm Novice to Technician. Don't forget to let Rick K8SCI know if you upgrade so that it can be mentioned in our newsletter and be updated on the club roster.

FIELD DAY, JUNE 27 & 28 Info inside this issue.

LIGHTNING HITS THE NCARC 145.290 REPEATER ANTENNA

At approximately 9:15 PM on Thursday May 14th the antenna being used on the NCARC 145.290 repeater took a direct hit by lightning. The top 2/3 of the antenna (9 1/2 feet) was knocked off the tower by the strike. All equipment remained fully functional but with greatly reduced coverage due to the antenna damage. A new antenna will have to be purchased and installed. The repeater is operating on the remains of the G-7 still left on the tower. If you would like to make a donation towards the new antenna, please send it to: NCARC, P O BOX 30529, CLEVELAND, OH 44130 and mark on the check (NEW REPEATER ANTENNA). Any donations will be greatly appreciated by the club.



YOUR NORTH COAST ARC MEMBERSHIP RENEWAL IS DUE BY JULY 1.

If you have not already done so, please return your completed form with your dues as soon as possible. North Coast ARC needs your continued support. NCARC membership year is from July 1 thru June 30.

AMATEUR RADIO CALL SIGNS AS OF JUNE 1, 1987 - EIGHTH DISTRICT

Groups: A-Extra: NW8Y B-Advanced: KE8LX C-General/Tech: N8IKG D-Novices: KB8CRL

MINUTES OF THE TRUSTEES MEETING MAY 7, 87 de Dave KA8ZRG

The trustees in attendance were Dan N8ETQ, Tom KD8EX, Jim N8GJR, Steve N8GNJ, Steve WD8INO, Ray WD8MHL, Steve NO8M, Rick K8SCI, Tim NR8T and Dave KA8ZRG. Guest in attendance were Dave N8ETY, Larry N8IAA, Jeff KR0J, Mike K9SSL and Jim KA8TPS.

Jim N8GJR gave a treasuers report. The clubs blance is $1,228.23. A motion was made by Jim N8GJR to increase the mailing budget by $30 and telephone by $20. The motion was passed.

Mike K9SSL submitted a finance committee budget for the 1987-88 fiscal year.

Steve NO8M brought up the point of replacing the G-7 antenna pending a report form the technical committee.

The trustees will hold a special meeting on May 16, 1987 to do long range planning.

Rick K8SCI made a motion to appropiate $50 to install a tone alert system. The motion was passed.

Rick K8SCI made a motion for the club not to go ahead with 220 MHz repeater coordination till after the long range planning session. The motion was passed.

Tom KD8EX made a motion to purchase another block of six shares for repeater purchase. The motion was passed.

The meting adjourned at 19:15 hours.

MINUTES OF THE GENERAL MEEETING MAY 7, 87 de Dave KA8ZRG

The meeting was called to order at 19:42 hours.

Jim N8GJR gave a finance report and announced that dues are being accepted for the 1987-88 fiscal year.

Mike K9SSL gave a finance committee report and announced a long range planning meeting for May 16, 1987. Anyone may attend.

A volunteer is needed to head up the education classes for next year (fall term).

The club needs one or two more generators for Field Day, preferably 3-4 KW.

Mike K9SSL voiced his concern on losing the 220 MHz band.

If you would like to order a club jacket contact Larry N8IAA for further details. The jackets will cost around $30-35 or you could have a club logo put on a clothing item for $5.

The meeting was adjourned at 20:29 hours.

MINUTES OF THE EMERGENCY TRUSTEES MEETING MAY 16, 87 de Dave KA8ZRG

Trustees present: Jim N8GJR, Steve N8GNJ, Steve NO8M, Ray WD8MHL, Rick K8SCI, Tim NR8T and Dave KA8ZRG. Guest present: Mike K9SSL.

The meeting was called to order at 0910 hours. The topic discussed was the replacement of Rick's K8SCI antenna which was being used by the club when struck by lightning. On a motion made by Ray WD8MHL the club is to replace Rick's G-7 antenna. Jim N8GJR made an amendment that the antenna cost cannot exceed $130.00. The motion was approved by the trustees.

The technical committee to recommend a repeater antenna.

The emergency meeting was adjourned at 0920 hours.

MINUTES OF THE LONG RANGE PLANNING MEETING MAY 16, 1987 de Dave KA8ZRG

Trustees present: Jim N8GJR, Steve N8GNJ, Steve NO8M, Ray WD8MHL, Rick K8SCI, Tim NR8T and Dave KA8ZRG. Guest present: Mike K9SSL.

The meeting was called to order at 0921 hours.

There were a number of long range goals discussed at this meeting. The following is a list of items discussed.

1). Other possible repeater sites. Goal is to get the best repeater coverage possible (HT coverage throughout Cuyahoga County. 2). Carry the North American Teleconference Radio Net. Rick K8SCI made a motion to support all TRN nets if the LEARA club does not desire to carry the nets. Ray WD8MHL made an amendment to the motion to support the net and put the costs into the next proposed budget if possible. The motion passed. 3). All the trustees were in favor of a 220 MHz machine. The technical committee to look into equipment possibilities and related cost.

The meeting was adjourned at 1100 hours on a motion from Jim N8GJR.

MINUTES OF THE TRUSTEES MEETING JUNE 4, 1987 de Dave KA8ZRG

Trustees present: Tim NR8T, Bob K8TTZ, Jim N8GJR, Dave KA8ZRG, Rick K8SCI, Pauline K8SCI, Steve NO8M, Steve N8GNJ, Ray WD8MHL, Dan N8ETQ, Tom KD8EX, Dick WD8ISB and Steve WD8INO. Guests present: Dave N8ETY, Jeff KR0J, Dan KB8A, Mary Lou N8ILL and Larry N8IAA.

The meeting was called to order at 18:20

** Treasuer's Report - Jim N8GJR gave a finance report. The club should have about $300.00 to carry over to next years budget.

** Technical Committee - Dave N8ETY gave the Technical Committee's report on what kind of antenna the club should replace the antenna struck by lightning late last month. The club will replace the antenna with a commercial grade fiberglass omni/diretional antenna at a cost of around $340.00.

Motion - Rick K8SCI made a motion for puchasing the antenna as soon as possible.

The meeting was adjourned at 19:25 PM.

MINUTES OF THE GENERAL MEETING FOR JUNE 4, 1987 de Dave KA8ZRG

Motion - Bob K8TTZ made a motion to approve the minutes as printed in the last North Coast Communicator.

** Finance report - The club has $1,545.00 and outgoing expenses were $494.87 for last month.

** Technical Report - Dave N8ETY reported on the type of antenna that the repeater should have.

Motion - Dan N8ETQ made a motion to accept the Technical Committees recomendation to authorize the Technical Committee to purchase a 6db Gain vertical antenna (commercial grade) with a cost not to exceed $390.00. The motion was passed.

** AWARDS - Awards were presented by Pat Mackin (Manager of the Emergency Assistance and Planning Division of the County of Cuyahoga) and given to members who participated in the Cuyahoga Tornado Drills on March 25, 1987. Members who received awards were: Dan KB8A, Dave N8AUH, Pauline KA8FOE, Paul N8HOB, Larry N8IAA, Tom N8IAN, Steve NO8M, Ray WD8MHL, Bill WB8NAQ, Al WD8QAC, Rick K8SCI, Bob K8TTZ, Fred WB8UDA and Russ WB8UPA.

Motion - A motion was made to either replace Rick's (K8SCI) antenna or give him money to put towards the purchase of a new antenna. The motion was passed.

Motion - Steve N8GNJ made a motion to aquire another block of repeater shares. This would bring the club to 20 out of 100 shares needed to own the repeater. The motion passed.

** Long Range Goals - The Long Range Goals of the club as seen by the Trustees were summorized.

1. To expand HT coverage.
2. A larger meeting room.
3. More support to the community.
4. More NCARES (North Coast Amateur Radio Emergency Service) activities, such as training activities after the Sunday night Net.
5. To go ahead with 220 MHz repeater coordination, and to establish a repeater on 220.

The meeting was adjourned at 20:50.

DO NOT FORGET TO RENEW YOUR NCARC MEMBERSHIP

All renewals are due by July 1. If you haven't already done so, please complete the enclosed NCARC membership renewal form and mail it today with your check or money order made out to N.C.A.R.C. for $12.00 (plus $1.00 for each family member) to: NCARC, P O BOX 30529, Cleveland, OH 44130.

WESTLINK SUPPORT FUND

Westlink has expressed an urgent need for donations to keep their Voice Reports on the air. N.C.A.R.C. will send your donation for Westlink to their support fund. Note on your check (made out to NCARC) that the donation is for Westlink and mail to the club P O Box.

FIELD DAY - SATURDAY JUNE 27 AND SUNDAY JUNE 28 - NORTH COAST A.R.C.

Call: KB8A

Class: 7, 8 or 9
(number of transmitters operating at the same time)

Operating Time:
2:00 PM Saturday June 27 thru 2:00 PM Sunday June 28.

Location: Soccer Fields at Barton & Bradley Roads,
North Olmsted, Ohio

Power Class: A (under 150 Watts)

Set Up Time: Starting 6:00 PM Friday June 26.
(Volunteers appreciated)

Tear Down Time: Starting 2:00 PM Sunday June 28.
(Volunteers really appreciated)

Over night Tent camping permitted (Fri & Sat): Limited RV space (no hook-ups).

This years NCARC Field Day site is in North Olmsted, Ohio at the Northern Soccer fields located just West of the intersection of Barton and Bradley Roads (many thanks to the City of North Olmsted). A map showing the location is provided below to assist you in traveling to the site.

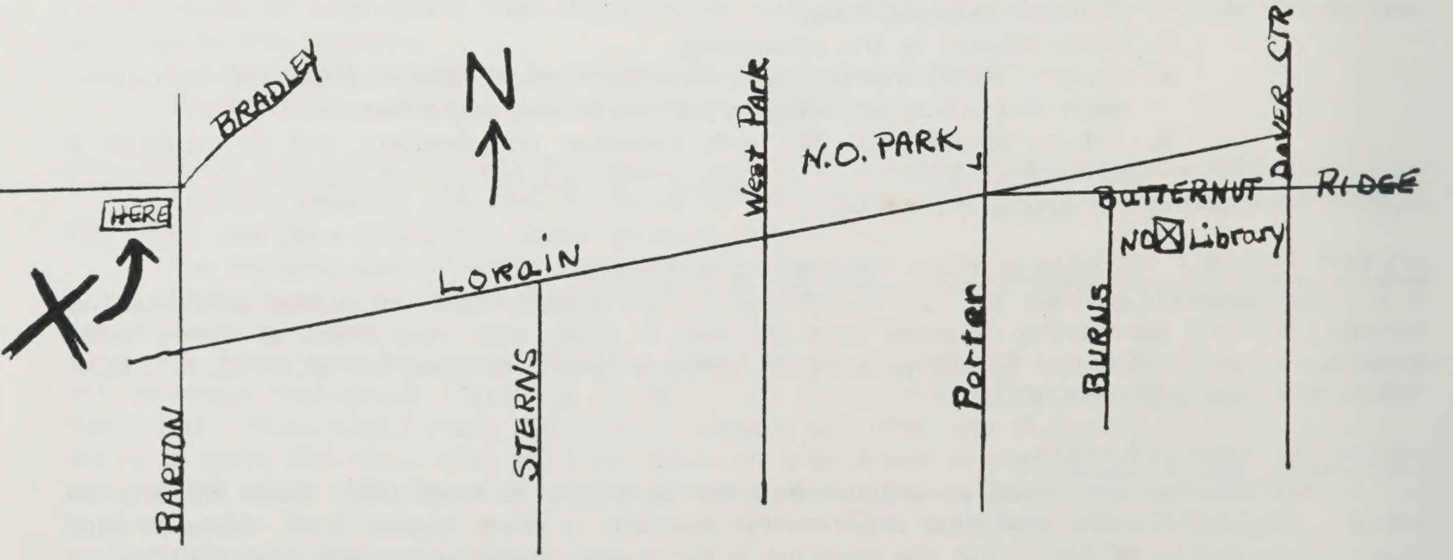
The following is a list of items that are always needed at Field Day. Please volunteer some of these if you can. Be sure to mark your call on anything so that it can be returned to you after the event.

HF CW RIGS
2M ALL MODE
3/4 M Rig
Yourself
Heavy Duty AC Power Cords
Generators (1 to 4 KW)
Tables (operating)
Yourself
Coax Junpers
Headphones
Scratch Paper
Yourself
HF Dipoles

Yourself
1 1/4 M Rig
Packet Stuff
Coax (lots of it)
Yourself
5 Gallon Gas Cans
Tent (sleeping)
Paper Cups
Yourself
Pencils & Paper
Lanterns (lighting)
Antenna Rotators
VHF Yagi (2 & 1 1/4 M)

HF SSB RIGS
Yourself
ROPE (for guying masts)
Barrell Connectors
Power Strip Boxes
Yourself
Paper Plates
Plastic Garbage Bags
SWR Bridges
Yourself
Telescoping Mast
Food & Drink
UHF Yagi (3/4 M)

If anyone can please help out with any of the above, please contact Rick K8SCI at 779-8999, Ron KB8BEB at 235-2882 or Ray WD8MHL at 671-0317. See you at Field Day.



PUBLIC SERVICE - JULY 3, 4 and 5, 1987 - N.O.S.O. - 7:45 AM TO 8:30 PM

Volunteers needed to provide two-meter hand-held amateur radio communications for the North Olmsted Soccer Organization (NOSO) event (Friday, Saturday and Sunday). This is a major event in North Olmsted and volunteers will be scheduled in shifts. Please contact Rick K8SCI or Pauline KA8FOE at 779-8999 to volunteer.

PUBLIC SERVICE - SATURDAY JULY 4, 1987 - BAY DAY 5 MILE RUN - 7:45 TO 9:45 AM

Volunteers needed to provide two-meter mobile amateur radio communications for this event in Bay Village. Please contact Tim NR8T at 871-3055 to volunteer.

MANY THANKS FOR THOSE THAT HELPED DURING THE MAY 9th PUBLIC SERVICE

Those that helped provide communications for the North Coast Women's Run (5 and 2 mile runs) in Middleburg Heights, Ohio were: Ron KB8BEB, Barb N8DAD, Skip N8HAD, Terry N8IAZ, Ray WD8MHL, Glenn WD8OMW, Rick K8SCI, Mike K9SSL, Tim NR8T and Jason KA8ZVX.

MANY THANKS FOR THOSE THAT HELPED DURING THE JUNE 7th PUBLIC SERVICE

Those that helped provide communications for the Rocky River 5 Mile Run in Rocky River, Ohio were: Steve N8GNJ, Jack N8HVQ, Bill WB8NAQ, Rick K8SCI, Tim NR8T and Joe KA8WJH (who led the pack using his bicycle).

FOX HUNT REPORT FOR MAY 9th

The Fox, Rick K8SCI and Pauline KA8FOE, hid in Fairview Park at the end of Bunker Hill Road. The road gets very close to Lorain Road but the only access to it is via Valley Forge Drive which must be accessed a considerable distance to the south of Lorain Road from West 210th St. Another confusing factor was that direct line-of-site into the MetroPark existed from that location making the Fox's signal very strong in many areas of the MetroPark Valley system. Rick and Pauline transmitted into a 4 element horizontal Yagi pointed at the Hunters meeting location for the first 5 minutes of the hunt, then rotated the Yagi 90 degrees towards the valley, then reduced power to 5 watts at 15 minutes into the hunt.

During the hunt, Rick and Pauline had interesting conversations with several neighbors in the area, as well as a Fairview Park Patrolman (who checked on our activities). All thought the hidden transmitter hunt was a really neat way to have fun.

First place hunter at 30 minutes was Jim N8LL, XYL Sandy, Ken N8EIJ, XYL Jan using a DoplerScant system.

Second place hunter at 33 minutes & 40 seconds was Bob K8DTS, his daughter Amy and Jim N8HPU using a DoplerScant system.

Third place hunter at 36 minutes & 15 seconds was Ray WD8MHL and XYL Carol using a 5 element horizontal Yagi with a missing reflector.

Fourth place hunter at 47 minutes & 30 seconds was Mike K9SSL, XYL Dee and Ron KB8BEB using a home-made 3 element horizontal Yagi on a wooden broomstick.

Fifth place hunter at 70 minutes was Larry N8IAA using a 5/8 mobile vertical and had started from West 130th and Lorain Road at the start of the hunt.

NORTH COAST ARC FOX HUNT SCHEDULE

Every 2nd Saturday of each month starting at 7:00 PM sharply. Anyone is welcome to join in on the fun. Hunters must be ready to go at 7:00 PM. Suggest that you plan to be at the hunters meeting location prior to 7:00 PM allowing enough time for your set-up before the start of the hunt.

The Fox transmits on a two-meter simplex frequency using equally transmit on/off periods ranging from 15 to 60 seconds in length (this time interval must remain the same throughout the fox hunt).

Fox hunt area is the Lake Erie Shore Line to the North, Route 83 to the West, Route 82 to the South and Route 237 to the East.

Hunters meeting location is to the rear of the North Olmsted Branch of the Cuyahoga County Library, Butternut Ridge Road, North Olmsted, Ohio. Talk-in on the 145.29 repeater.

RELAYED BY KB8NW FROM KB8CI PBBS

```
Msg# TR  Size To  From  @ BBS Date   Title
5572 BN 11054 ALL   N8NN      870524 220 MHz Wide Area Network
R:870524/2037z @:AD8I  The OHIO GateWay #:18906 O:N8NN
R:870524/1627z @:N8NN  DAYTON LAN #:3133 O:N8NN
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The following draft proposal for a 220 MHz network will be submitted to the membership at the OPAC Spring Meeting, Saturday, 30 May 1987, 10:00 AM at the Colubmus Red Cross, 995 East Broad Street, 5 blocks East of I-75.

DRAFT PROPOSAL for a 220 MHz WIDE AREA NETWORK FOR OHIO (OHIONET)

sponsored by THE OHIO PACKET COUNCIL (OPAC)

EXECUTIVE SUMMARY This paper describes an amateur radio network capable of interconecting computer systems via packet radio for the purpose of transmitting written messages. It will provide a speedy, reliable network to support emergency and disaster communications, severe weather warnings, and routine messages on the National Traffic System. Planning and management for the network within Ohio is provided by the Ohio Packet Council, OPAC, incorporated under the laws of the state of Ohio as a not-for-profit corporation. The Indiana Digital Experimenter'sAssociation, IDEA, will coordinate the network within Indiana, and the Pennsylvania Packet Association, PaPa, will be responsible for the network within Pennsylvania.

This network is a fixed network installed statewide to provide maximum coverage across the state, linking together all the major population centers in Ohio. It is capable of receiving and transmitting to temporary locations or mobile stations when needed. It will be operated 24 hours a day.

Portions of the network are presently in place. When completed, the network will connect to similiar packet radio networks in surrounding states, eventually providing a complete packet radio network coast to coast. Equipment for the network is now provided by private amateur radio operators at their own expense.

To complete the construction of this network, assistance is needed from private industry, service organizations, and amateur radio clubs and associations. These groups can provide space on existing radio towers and in buildings for the installation of the network radio equipment. Assistance is needed for the purchase of radio equipment and for the operation and maintenance of the completed network.

INTRODUCTION Packet radio is undoubtebly the fastest growing digital communciation technique today. Virtually hundreds of stations are commencing operation across the United States each month. Within fifty miles of Dayton, Ohio, more than 500 packet radio station are heard on-the-air each month. There are more than 22,000 licensed amateur radio operators in Ohio, 12,000 in Indiana, and 19,000 in Pennsylvania.

Packet radio takes advantage of the speed differences between human operators and the speed at which microcomputers can send data via radio. By buffering keyboard input from a microcomputer until a full line is typed and then sending it in a burst at high speed, a packet radio station needs to transmit only intermittently. During the transmission gaps, other stations can send their data on the same frequency. Packet systems use automatic repeat requests, error correcting, and an automatic repeater scheme.

Computers operating as bulletin board systems, BBS, provide the capability for automatically storing and forwarding the messages sent by individual packet radio operators. The bulletin boards are linked together to form a network, automatically forwarding messages to their destination. The BBS's find alternative paths through the network when the direct routes are busy or inoperative. This allows messages to be sent during emergencies when parts of the network may not be operating. There are now 15 BBS's in Ohio, 11 in Indiana, and 16 in Pennsylvania. All of these BBS's operate 24 hours a day and are linked together to provide automatic message forwarding.

(Continued)

With all of the packet activity today the present system is becoming overloaded. An overloaded system results in messages being delayed during automatic message forwarding. Often these delays will be several hours, possibly even a full day will be required for a packet message to travel across the state. This system does not now adequately meet the need for fast, reliable communications during emergencies. During emergencies, packet radio activity will increase and even more delays will occur.

To reduce the overload, the following actions can be taken:

1. Move the network to new, unused frequencies,
2. Increase the transmission speed of the network,
3. Limit access to the network to packet stations forwarding messages.

The primary purpose of the 220 MHz Wide Area Network is to improve packet radio message autoforwarding. The 220 MHz Wide Area Network will use all three of these techniques to accomplish the goal of fast, reliable packet radio communications.

TECHNICAL SPECIFICATIONS The 220 MHz network will be installed the three broad phases, taking advantage of new packet technology as it emerges. At any point in time portions of the network may be in any one of these phases. The three phases in order of their priority are as follows:

1. Installation of digipeater sites to provide a major trunk line across Ohio, linking Pennsylvania and Indiana. Installation of additional digipeater sites to provide complete coverage of Ohio and to provide trunks into West Virginia, Kentucky and Michigan.
2. Installation of NET/ROM software or a similiar system to provide a transport layer protocol.
3. Upgrade of the standard 1200 baud modems to 9600 baud modems and installation of the new radios required for a high capacity network.

The initial network will be established on 221.11 MHz at 1200 baud using T.A.P.R. TNC-2 software.

Initially, access to the 220 MHz Wide Area Network will be limited to BBS stations who are members of OPAC, IDEA, PaPa, and other cooperating packet associations in surrounding states.

When sufficient network capacity exists, resulting from the installation of higher speed modems, the network will be opened to all packet radio stations, provided that three-quarters of the participating BBS sysops agree.

The major computer and digipeater sites will be operated by the individuals at these locations:

Central Ohio	Circleville	- Joe Subich, AD8I
	Westerville	- W8SGT or K8DDG recommended
	Steubenville	- Greg Day, KC8JN
Southwest Ohio	Dayton	- Bert Garcia, N8NN
	Forrest Park	- Ken Meinken, WA8JXM
	Yellow Springs	- Gaylord Crawley, WB8ICL
Northwest Ohio	Union City	- Dave Zeph, W9ZRX
	Findley	- N8ET recommended
	Toledo	- (name, callsign)
Southeast Ohio	Athens	- (name, callsign)
Northeast Ohio	Mansfield	- (name, callsign)
	Wooster	- (name, callsign)
	Cleveland	- KB8CI recommended
Indiana	Anderson	- WA9IVB-1 recommended
	Lafayette	- KM9D recommended
	Westfield	- Dave Zeph, W9ZRX
Kentucky	Elsmere	- Greg Greenwald, KD9PU
Pennsylvania	xxxxxxxxx	- (name, callsign)
West Virginia	xxxxxxxxx	- (name, callsign)

(Continued)

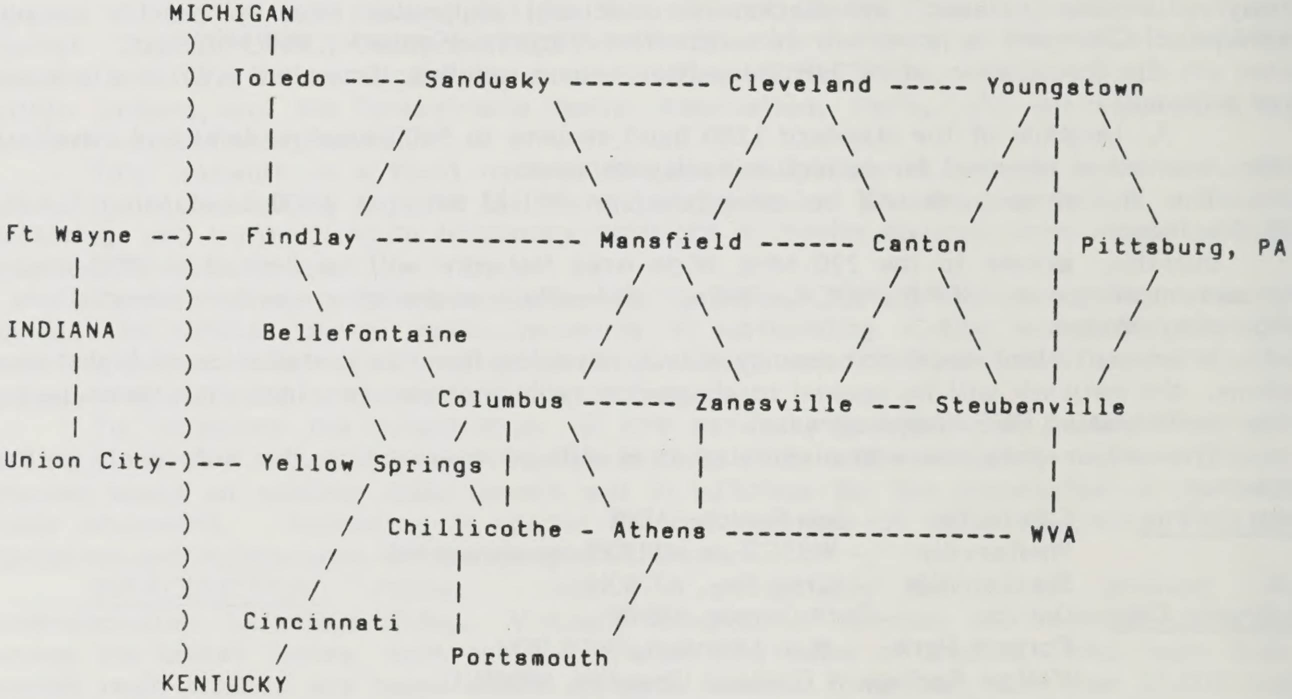
NETWORK MANAGEMENT All actions concerned with the 220 MHz Wide Area Network within Ohio will conform to the provisions in the Constitution of the Ohio Packet Council.

Within Ohio the OPAC Network Management Committee is responsible for establishing technical specifications, designating network configuration, and proscribing a time schedule for network construction. This committee is responsible for identifying network costs. This committee will manage the use of equipment donated or loaned to OPAC for the network. This committee will coordinate with similiar committees in IDEA and PaPa on the interconnections with packet networks outside of Ohio.

OPAC will establish an OPAC Fund Raising Committee which will be responsible soliciting monetary support for the network. This committee will be subject to review by the OPAC Audit Committee as directed by the OPAC Executive Committee. The fund raising committee will produce a public financial statement quaterly.

The OPAC Executive Committee will identify the organizationsoutside of OPAC that will participate in the 220 MHz Wide Area Network.

PROPOSED DIGIPEATER SITES FOR THE 220 MHz WIDE AREA NETWORK



The following survey will be distributed at the OPAC Spring Meeting:

220 MHz PACKET NETWORK SURVEY Please help us identify equipment available for full-time support of the network. Equipment can be either DONATED or INSTALLED AND MANITAINED by you. Donated equipment becomes the property of OPAC unless you specify otherwise.

Mail your response to Bert Garcia, N8NN, 4325 Ridgepath Drive, Dayton, Ohio 45424.

CALL__________ NAME______________________________

MAILING ADDRESS____________________________________

TELEPHONE NUMBER: ( ) ________________

ITEM	$ VALUE	DONATED OR INSTALLED

SPECIAL OFFER
(SEE BELOW)

WQ World's Finest
SOLID MILK CHOCOLATE
Made especially for

Real Milk
Chocolate

North Coast Amateur Radio Club
P.O. Box 30529, Cleveland, Ohio 44130
Thank you for your support

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Coast
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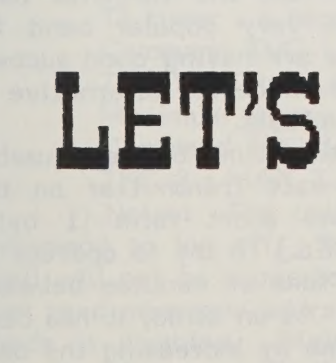
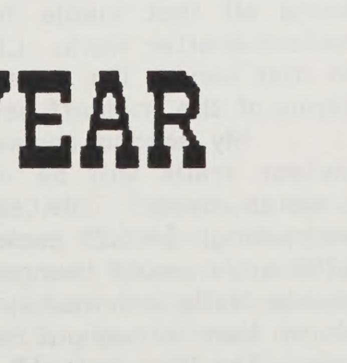
NCARC FUND RAISING
EAST CALL 486 5833
WEST CALL 779 8999
LET'S ALL HELP BY GETTING INVOLVED SELLING CANDY BARS!

LET'S BEAT LAST YEAR
$1,485.00





Gateway: The ARRL Packet-Radio Newsletter Volume 3, Number 18, May 22, 1987
Pub by: ARRL, 225 Main, Newington, CT 06111, Editor: Jon Bloom, KE3Z via BARF80 BBS

RF MODEMS DEBUT AT DAYTON

Two manufacturers recently announced the availability of 220-MHz RF modems. Advanced Electronics Applications and GLB both previewed their radios at the Dayton HamVention this year.

The AEA unit, designated the RFM-220, is a synthesized transceiver covering the entire 220-MHz band in 10-kHz steps, with programmable offset between the transmit and receive frequencies. The synthesizer can be remotely controlled. Data at rates up to 9600 bauds can be sent through the radio, as can voice signals. The transmitter output can be adjusted for from 1 to 30 watts. The receiver features a GaAs FET front end with multiple helical resonators. Price of the RFM-220 is in the $600 range.

GLB's entry in the RF modem field, the NETLINK 220, operates at 19,200 bauds in a specified bandwidth of 30 kHz and is crystal controlled. It covers the 220-MHz band and features oven-controlled oscillators for stability, digital automatic frequency control (AFC), PIN-diode antenna switching and helical resonators in the receiver front end. The NETLINK 220 is priced at $649.

Both units connect directly to a TNC for digital data communications.

These manufacturers can be contacted at:

GLB Electronics, Inc., 151 Commerce Pkwy, Buffalo, NY 14224 (716) 675-6740
AEA, P O Box C-2160, Lynnwood, WA 98036 (206) 775-7373

PSK MODEMS ON METEOR SCATTER

The following discussion from Mike Spann, WB6KTN/ZR5KH, comments on the use of PSK for meteor scatter communications.

I read with interest Tom Clark's remarks on the use of PSK modems for meteor-scatter links [Gateway, Volume 3, Number 16]. What he says about PSK being the ideal choice for meteor scatter operations is true. As long as the Costas feedback loop filter [in the demodulator] is kept wide enough for fast locking time, the improved signal-to-noise-ratio performance and Doppler rejection of PSK is essential to low-power (less than 10-kW) operation.

There are two comments that I would like to make on Tom's suggestions. The first regards the choice of operating frequency. In meteor-scatter communications, there is a tradeoff between signal strength/duration and interference. The duration of meteor bursts is proportional to 1/f^2 and the received power is proportional to 1/f^3, where f is the frequency being transmitted. This indicates that the lower the frequency the better. On the other hand, the lower frequencies suffer from higher levels of both natural and man-made noise as well as being "plagued" by other forms of beyond-the-horizon propagation. Because of its popularity for other, more normal forms of propagation, I don't see the 10-meter band being all that viable for meteor scatter. The 6-meter band is a very popular band for meteor-scatter work. Like most experimenters in meteor scatter, we are having good success in that band. The 4-meter band, on the other hand, looks like an even better alternative in terms of the tradeoff between noise and losses where that band is available.

My second comment is with regard to data rate. The waiting time between usable meteor trails will be minimized at about 4000 bit/s with a 500-watt transmitter on the 6-meter band. This requires using short (8-character) blocks and short form (1 byte) addressing. [AX.25 packets would not conform to this specification--Ed.] To try to operate at 1200 bit/s would change the waiting time from tens of seconds to tens of minutes between usable trails and would require reducing the block size even further. As an aside, it has been shown that throughput can be increased at the expense of waiting time by increasing the data rate. The limit imposed by intersymbol interference is about 200 kbit/s.

Just how to get permission for a 5- to 10-kbit/s PSK modem on either the 4- or 6-meter band is a problem that will have to be addressed before amateur meteor scatter will be viable as a reliable packet radio mode. [This is not a problem for US 6-meter operation.--Ed.] After that, you need only figure out how to deal with your neighbors when you pump out 1.5 kW in a 20-kHz bandwidth just a few megahertz from their favorite TV station! By Mike Spann, WB6KTN/ZR5KH

Gateway: The ARRL Packet-Radio Newsletter Volume 3, Number 18, May 22, 1987
Pub by: ARRL, 225 Main, Newington, CT 06111, Editor: Jon Bloom, KE3Z via BARF80 BBS

JAMSAT ANNOUNCES NEW FO-12 DIGITAL MODE

On May 4, new software in the FO-12 satellite was put into operation.

The new mode allows "on demand" operation of Mode JD, which means that the bird is usually in the listening mode and starts transmitting mode JD PSK signal at 435.910 MHz immediately after receiving any acceptable AX.25 frame (including a UI frame) through one of four uplink channels, 145.85, 145.87, 145.89 or 145.91 MHz and continues its operation as long as AX.25 frames are received at intervals of less than three minutes. After 3 minutes without receipt of an AX.25 frame the satellite returns to the listening mode.

This "on demand" operation happens while the satellite is in a 2-hour ON period. While the bird is in an ON period, you will hear a 2-3 second PSK burst every minute so you will know that mode JD is available and can be switched on by sending some packets to the satellite. You will hear nothing during the 2-hour OFF period.

This new operation mode will become the base of the coming FO-12 BBS service.

The weekly operation schedule will be determined after enough power usage data for this new mode has been acquired and analyzed. From JA2PKI and JR1FIG

FO-12 BBS PROGRAM NEARS COMPLETION

The software for the FO-12 on-board BBS program is now running on the JAS-1 engineering model and being tested by the JAMSAT software team. The first version of BBS program, which has a limited number of commands, will be loaded and tested on FO-12 soon.

Please keep in mind that during testing, though you may hear PSK beacons from the FO-12 BBS, it does not mean that the BBS is available for public use. While the software team is testing its functions your attempt to connect to FO-12 may fail, returning a busy response.

The first version of the program will have following commands:

F List latest 10 message headers with message number.
F* List all the message headers.
R <n> Read a message numbered <n>
W Send a message. You will be asked for the addressee and subject.
K <n> Kill message number <n>. A message being read by other station(s) cannot be killed. (FO-12 BBS is a multi-user system.)
H Help. List the available commands. It may list commands which are not currently available, such as M and A.

Your TNC should be set as follows:

Protocol : It must use AX.25 version 2. WA8DED PROMs are needed for TAPR TNC 1.
Command TNC-1 : V2
TNC-2 : Ax25l2v2 ON
T1 timer : 6 seconds or longer.
Command TNC-1 : F6
TNC-2 : FRack 6
Maximum frames : 2 or 3 is suggested.
Command TNC-1 : O2 or O3
TNC-2 : MAX 2 or MAX 3

Notes: The call sign of FO-12 to which you connect is 8J1JAS. There will be no command to log off. Simply disconnect by using your TNC's disconnect command. Personal mail will not be supported by this first version. Your messages can be read by anyone and you can read messages addressed to someone else. While the BBS is in operation, digital repeater mode is disabled. Digipeated packets will not be accepted by FO-12. An increase in the number of users will slow the BBS response and require a longer T1 time. The maximum acceptable length of the data portion of a packet (PACLEN) is 199. A shorter length is desirable. FO-12 transmits at PACLEN=128 and MAXFRAMES=1. This information is preliminary and may be changed without notice. From JA2PKI and JR1FIG

Gateway: The ARRL Packet-Radio Newsletter Volume 3, Number 18, May 22, 1987
Pub by: ARRL, 225 Main, Newington, CT 06111, Editor: Jon Bloom, KE3Z via BARF80 BBS

NTS RIDES THE WAVES!

Brian, N1BBT/MM, is in charge of communications (and a myriad of other things) for the Massachusett Marine Academy's training vessel Patriot State. They are presently in dry dock in Virginia for repairs. Whether or not they set sail this summer is open to debate, but when they do they'll likely head for the Mediterranean. On board, they typically have 600-700 love- and family-starved Cadets and crew who rely heavily on Amateur Radio.

A few years back, N1BBT, KW1U, WA1TBY and others met with K1OJH and several other key New England Packet Radio Association (NEPRA) people in the hopes of using their newfangled packet equipment to handle the several thousand pieces of formal message traffic that are generated during a cruise. Due to the lack of packet equipment and people knowledgeable about packet traffic procedures and a host of other reasons, packet fell through and we had to rely on CW.

That was all well and good, but now with the excellent extensive packet network on 20 meters and with N1BBT's on-board packet gear, we're ready to let autoforwarding do it's thing. WA1WLV's BBS will be made available to accept traffic from Brian. Use of NTS designators such as NTSEM, NTSME etc seems to be working well, so that method will be used. By Luck Hurder, KY1T, in the NEPRA PacketEar

NOVICE PACKET ACTIVITY

We at Gateway would be interested in hearing from the packet community what Novice packet activity is occurring. How many Novices are using packet in your area? What frequencies are being used on 10 meters and 220 MHz? Are there digipeaters and/or BBSs available in the 220 MHz Novice band? How about gateways, either BBS or digipeater, between 220-MHz Novice frequencies and the local 2-meter networks? Anything happening on 1.2 GHz? Please respond to: Gateway Editor, ARRL, 225 Main Street, Newington, CT 06111

MFJ-1270B HINTS & KINKS

I recently installed Software 2000's NET/ROM firmware in an MFJ-1270B. Several minor modifications to the TNC are recommended by Software 2000, and in the course of making these modifications I came across a couple of problems. So that others can avoid the troubleshooting I had to do, I'll present the information here.

One of the changes needed is to change the CPU clock speed from 2.46 MHz to 4.92 MHz. According to the MFJ manual, this can be done by moving the JMP2 jumper. JMP2 is a three-hole jumper, with the three holes in a line. The manual says that the fast clock can be obtained by moving the jumper from from the RIGHT position (shorting the center and rightmost pins) to the LEFT. (You have to cut a PCB trace that normally makes the RIGHT connection.) Unfortunately, this isn't true! To get the fast clock, what you really need to do is connect the leftmost and rightmost pins, leaving the center one unconnected. Apparently, the board layout in this area changed slightly between the MFJ-1270 and MFJ-1270B, but the manual wasn't updated.

NET/ROM also specified use of 9600 bauds on the serial port. When I set the switches to use 9600, operation of the TNC became intermittent. Sometimes the serial port would operate perfectly, other times it wouldn't work at all. Wiggling the DB-25 serial port connector or the DIP switch at the rear of the TNC would activate the intermittent. After investigation, I found that the circuit-board trace that carries the 9600-baud clock signal runs directly under the DB-25 connector, which has a metal housing and is bolted to the circuit board. Apparently, the clock line was shorting to the grounded housing of the DB-25 connector. To fix this, I removed the bolts from the connector, gently lifted it and slipped a piece of thin cardboard between the connector and the circuit board. After I replaced the bolts and reassembled the TNC, the intermittent was gone.

Neither of these problems showed up on an original MFJ-1270 to which I made the same changes. (The '1270 uses a DB-25 connector with a plastic housing.) By KE3Z

THE W5YI REPORT, Dits & Bits, Vol 9 #11 - 06/01/87
HamNet Electronic Edition, CompuServe's Ham/SWL Forum via BARF80 BBS

FCC Rules on VEC Petitions for Reconsideration

On August 4, 1986, the FCC adopted a Report and order (Docket 86-196) further deregulating the amateur radio operator volunteer examination program. The new rules were primarily directed at the various volunteer examiner coordinators (VECs).

A VEC acts as the administrative liasion between the Commission and the volunteer examiner in the field who conduct license upgrade examinations at the Technician Class level and above. The effective date of the new guidelines was January 1, 1987. Six Petitions for Reconsideration were filed requesting that four issues in the Report and Order be reexamined.

*** (1.) The first issue concerned the new VEC question maintenance responsibility. Prior to 1987, the FCC revised the various questions by issuing PR-1035 bulletins indicating the new pools. The FCC said they "proposed this transfer because our maintenance of the pools had become mainly a custodial function (and) ...the VECs are capable of satisfactorily performing the task and are in the best position to do so in their role as coordinators."

Concerned that different VEC's might have different written test questions, the ARRL maintained that the only way to assure uniform examinations was to have one central standardized question pool. The League argued that "Congress intended for the FCC to be the entity to maintain the pool." Another petitioner, Arthur H. Eklblad, K0QQ, stated that different question pools would "introduce competition in the examination process as examinees seek the easiest tests."

*** (2.) The second issue concerned the content of the telegraphy examinations. Previous rules required that examinees must know and could be tested on all alphabet letters, numbers, punctuation (period, comma, question mark) and prosigns (AR, SK, BT and DN). The new rules require that each examinee must be examined on each of these characters.

We (the W5YI-VEC program) protested that rule stating that this would require every VEC to complete new recorded code examinations and that, due to the many different characters (there are 42), it would be a burden to use every one in a five minute code transmission -- particularly at the Novice 5 word-per-minute level.

Lyndell Miller, WA0KUH, believed that it would be nearly impossible to prepare a QSO-type transmission meeting these requirements due to conflicting meanings of certain prosigns. Gordon Girton, W6NLG, felt the telegraphy requirement for Novices and Technicians should be minimal. He asked that punctuation and prosigns be omitted from Element 1(A) - the 5 word-per-minute code test.

*** (3.) The third issue concerned the question topics in the various written examinations. The question pools contain approximately ten times the number of questions that will be asked in an actual examination. The FCC specified a certain percentage of questions were to come from each of nine topics. David B. Popkin, W2CC, was concerned that the percentages did not result in a whole number of questions and that "the rule concerning the grading of examinations is deficient because it does not provide for any persons other than the administering VEs to pass on the correctness of the examinee's answers."

*** (4.) The fourth matter concerned the possibility that an applicant might inadvertently retake the same examination as previously failed. VECs had been instructed not to readminister the same examination to the same person. Both Miller and Popkin sought reconsideration since another VEC or VE team might inadvertently readminister the same telegraphy message or question set.

Originally, it was contemplated that each VEC could, if it wished, compile its own pool of questions. To safeguard against a pool of inordinately easy or ^difficult questions, the FCC said it would monitor the pass/fail rates and, if necessary, challenge inappropriate questions. The League felt that this mechanism was insufficient to assure consistency of examinations from VEC to VEC.

(Continued)

FCC Rules on VEC Petitions for Reconsideration (Continued)

The FCC acknowledged that as a result of cooperation among the VEC's, much work has progressed toward standard question pools. "In view of the widespread sentiment in favor of standardized pools, we will amend Section 97.521 to require that the VECs cooperate in maintaining a common standard question pool for each element."

"Maintenance of a question pool includes the revision of existing questions and the addition of new questions to reflect changes in technology, regulations or other developments which have a bearing on the amateur service.

This requirement will go into effect January 30, 1988. Until that time, questions will be drawn from the existing question pools which are frozen, except for changes in the other rules."

The FCC said "In our view (code examinations that contain all required ^characters) is not an unreasonable standard." The Commission said Girton's request to eliminate certain of the charcters "is outside the scope of this proceeding and will not be dealt with here."

The Commission also denied our request that telegraphy examination messages contain a good mix or a specified percentage of the required characters rather than all of them. "There never has been a requirement that recorded messages be used for the telegraphy examinations, nor that the VECs provide messages to VEs. Because a VEC invested in recordings that were not required is not an adequate reason to delay implementation of the telegraphy examination requirements."

We understand, however, that the FCC still may (on their motion) amend the new code testing requirements since there was a widespread feeling among all VECs at the recent Dayton VEC Forum that the new code test standard was a burden to volunteer examiners. The FCC's Ray Kowalski acknowledged that they were looking into this -- even though the Petitions for Reconsideration have already been ruled upon. We will have to wait and see what happens on this.

The Commission said that a written examination must be such as to prove that the examinee possesses the qualifications of an amateur radio operator based ^upon the International Radio Regulations, Article 32, Number 2736, states that "Administrations shall take such measures as they judge necessary to verify the operational and technical qualifications of any person wishing to operate the apparatus of an amateur station."

"The Communications Act of 1934 (Section 303) requires that the questions for each element be concerned with the related privileges authorized by the operator license. The examination topics and the percentage of questions that must be asked on each topic is based on the number of questions previously specified."

The FCC said that the examination designer has the flexibility to incorporate one or more additional questions should the need arise to do so. "While the percentage of questions specified for each topic may not always result in a whole number, the administering VE's can round off the number as necessary.

"It has been our policy that neither the same telegraphy message nor the same question set should be readministered to an examinee. We believe the intent of the rule is necessary and reasonable and should not be deleted based upon the speculation that an examinee might seek out another VEC (VE team) using the same test for reexamination. We recognize that another VEC (VE team) might unknowingly give the same examination as the one that the examinee failed. Where this was not intentional, we do not contemplate that enforcement action would be taken."

Petitioner Popkin also asked for reconsideration of Section 97.29(a) which makes the adminstering VEs responsible for determining the correctness of the examinee's answers. "We find no need for additional review of their judgement in grading examinations," the FCC said. "Sufficient provisions for review already exist. ...The expert qualifications of VEs comprise the foundation of the volunteer examiner systems. Their knowledge and experience in amateur radio are relied upon to recognize the correct answers to the questions."

(End)

HR DX Bulletin NR 23 From ARRL Headquarters Newington CT - June 12, 1987
Relayed by KB8NW/OBS via BARF80 BBS - To All Radio Amateurs - BT

Thanks to WB2IVO and The Western New York DX Association for the following DX information.

ST. Pierre and Miquelon. FP/K1RH and FP/W1CCN will be active through June 16. All QSLS should go to their home calls respectively.

Andorra. KV4AM and WY4A plan to operate as C30LEF June 20 through July 15 on 80 through 10 meters. All QSLS to KV4AM. G4WPS Plans to operate C30DAW on 50.110 mhz on June 15.

Falkland Islands. VP8WA is active primarily on 15 meters. He can be found every Tuesday at 1600Z on 21233 khz with W2JY. QSL to his callbook address.

Afghanistan. Several YA stations have been heard recently on 20 meters. Chances of their authenticity are slim, but the rule of work first, worry later applies. There is also a rumor of a possible YA operation by two UA3 stations next month.

New Hebrides. YJ0ARW is on and very active. He can be found most mornings, starting at about 1000Z on the lower end of 40 meters. QSL to ZL1AMO.

Asian/Pacific DXpedition. 4X6TT has planned a DXpedition starting in late July, with planned stops at XZ, 9N, 9M, V85, 9V, BY, VS6, 3D2, ZK3, ZK2, ZK1, C2 and various ZL stops. Dates and lengths of stays at each stop are still not certain and the possibility of additional stops exists.

Solomon Islands. CRRL news reports that the Solomon Islands Amateur Radio Society is trying to dispose of 2000 QSL cards addressed to H4/VR4 amateurs who have left without leaving forwarding addresses. Former h4/VR4 Amateurs are asked to contact the society at Box 418, Honiara, Solomon Islands.

Heard and worked recently in Western New York,

20 meters

A92BE	14152 KHz	0300Z	
A92C	14196 KHz	1740Z	
FK8FG	14018 KHz	0350Z	
FK8FN	14024 KHz	0604Z	
H44RO	14309 KHz	0300Z	
KH9AC	14309 KHz	0430Z	
OD5LX	14021 KHz	0325Z	
TA4A	14027 KHz	0059Z	
VK0GC	14309 KHz	0300Z	
VK9NS	14026 KHz	0400Z	
VP2MDY	14030 KHz	2049Z	
VS6DO	14014 KHz	1157Z	
XU1SS	14164 KHz	1350Z	
YB0TNX	14180 KHz	1245Z	
YI1BGD	14183 KHz	2000Z	
YJ0ARW	14025 KHz	0500Z	
ZK1XV	14309 KHz	0250Z	QSL to VK2BCH
ZL7AA	14309 KHz	0245Z	
ZY0TC	14010 KHz	0330Z	
3B8CF	14032 KHz	0300Z	
8Q7CH	14180 KHz	0150Z	

40 and 80 meters

PZ1DV	7003 KHz	0955Z
VK1BB	7002 KHz	1015Z
VK2EVD	7003 KHz	1015Z
VK4XA	7010 KHz	1004Z
YJ0ARW	7008 KHz	1030Z
ZL4BO	3797 KHz	1027Z

RTTY - 20 meters

CP1OJ	14095 KHz	2015Z
HL4IID	14081 KHz	1450Z
HL9OB	14089 KHz	1140Z
OY/DF7JC	14084 KHz	2122Z
V44KT	14083 KHz	1315Z
VK6ABP	14086 KHz	1145Z
VK6TN	14086 KHz	1145Z
VU2IJ	14089 KHz	0215Z
7X4MD	14093 KHz	2150Z

AR

Good Luck on DX de KB8NW/OBS
Relayed by KB8NW/OBS @ BARF-80 BBS

PLEASE SEND IN YOUR NCARC MEMBERSHIP RENEWAL NOW!

Gateway: The ARRL Packet-Radio Newsletter Volume 3, Number 18, May 22, 1987
Pub by: ARRL, 225 Main, Newington, CT 06111, Editor: Jon Bloom, KE3Z via BARF80 BBS

TIDBITS FROM CAPRA

The Chicago Area Packet Radio Association (CAPRA) will ask the Northern Illinois Packet Frequency Council to coordinate additional frequencies for 1200-bit/s operation in the 220-MHz Novice band. Present allocations on 220 MHz are not in the Novice part of the band. Additional requests will be made for 1200- and 9600-bit/s frequencies in the 440 MHz band and for 56-kbit/s frequencies in the 902 MHz band.

In it's comments to the FCC regarding General Docket 87-14, the proposed reallocation of 220-222 MHz, CAPRA detailed the technical problems it has experienced operating an experimental 9600-bit/s link in downtown Chicago. The front end of the receiver had to have added filtering to reject signals from a channel 11 TV transmitter, and transmitter power had to be increased to overcome interfering signals from the radiated local oscillators of nearby television receivers tuned to channel 7. These effects would undoubtedly cause problems in the proposed land mobile use of this frequency range as well. From Steve Goode, K9NG

MODEMS NEEDED FOR HF

One of the issues to be addressed in the near future is increasing the speed limit for HF packet. The League is planning to file a request with the FCC for special temporary authority (STA) that will allow 1200-baud testing. The critical element of such a speed increase is identifying or developing modems for use at 1200-bauds. Current Bell 202 modems, such as are used at VHF, are not well suited to the HF environment. Current 1200-baud modems, as used on VHF, are not very bandwidth efficient. They use a frequency shift of 1 kHz, which is far more than is needed, and do not make any special effort to reduce the distant (from the center frequency) sidebands; the SSB transmitter's crystal filter acts as a last line of defense to limit the transmitted bandwidth. On the crowded HF bands, a narrow occupied bandwidth is important, and the high noise levels dictate that receiver bandwidth be made as narrow as is practical. The relatively low signal-to-noise ratios found on HF also impact the modem design, as does the presence of multipath distortion. These considerations make selection of the "best" modem standard problematic, but one advantage of higher speeds is the shortened transmission time compared to the period of the fading cycle.

ARRL has been in contact with some of the possible manufacturers of such devices, suggesting that now is the time to develop the techniques. Some of the possible approaches to higher speed modems include:

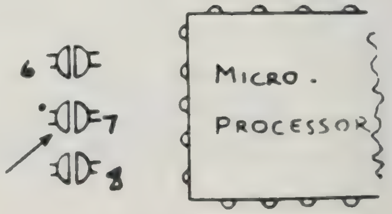
- o 1000-Hz shift FSK (Bell 202), as is used on VHF now.
- o 800-Hz shift FSK (CCITT V.23), which is avail. in the AM7910/AM7911 modem chip.
- o 600-Hz shift FSK (MSK).
- o Standard PSK techniques, including Bell 212A and CCITT V.22 standards.
- o FO-12 PSK modems.
- o V.26ter (1200 and 2400 bit/s PSK), as used in the Kantronics KPC-2400.

In the ARRL lab, work is under way evaluating 1200-baud MSK modem chips made by MX-COM, Inc. We intend to measure the performance of these modems versus Bell 202 and V.23 using the AM7910 chips. Other approaches need to be tested as well, and we would like to hear from anyone who is working in this area. By KE3Z

YAESU Model FT-23R frequency expansion:

This mod will give you full coverage of 140 to 164 MHz!

1. Remove battery.
2. Remove bottom plate by removing 4 screws. Remove side screws.
3. Pull knobs straight up. Remove top plate and gasket
4. Separate radio halfs and locate main microprocessor.
5. Remove solder jumper from Pad #7.
6. Reverse steps 1 thru 4 and don't xmit out of band!



HR Propagation Forecast Bulletin NR 24 Fm ARRL HQ Newington CT - June 15, 1987

Relayed by KB8NW/OBS via BARF80 BBS - To All Radio Amateurs - BT

In the first two weeks of June the solar flux was seven to 17 points below the corresponding days in the previous solar rotation, in early May. A disparity of as much as 17 points from one month to the next is not as bad as it might appear to be. Looking back to June Of last year we see that 70 was the high point of the month, and there was only one such day. This year the June low so far has been 74. June of a year ago was the lowest month of cycle 21, with an average of only 67.56. There has been a marked rise from a year ago with days now being called poor that would have been considered cause for celebration during last summers almost total quiet.

The sun has been showing signs of new actitity on the way in the past few days, and flux readings are expected to be a few points higher later this week. Lower values are likely near the end of June, but this will not make a significant difference in propagation on the DX frequencies. The dominant factor in the DX picture will continue to be sporadic E skip, which has been above normal this summer. This mode nearly always peaks late in June, but it carries over through at least July with only a slight drop in intensity and geographical coverage. E skip becomes quite rare after late July, though it can appear at any time or season. E skip is mostly a matter of 500 to 1200 mile coverage but up to 2500 miles or more may be common in the closing weeks of the E skip season.

The author of these bulletins always welcomes suggestions for improving their content. Our address has changed for the summer. Until early September mail should be addressed to Ed Tilton, W1HDQ, PO Box 137, Canton, CT 06019.

American sunspot numbers for May 28 through June 3 were between 2 and 13 with a mean of 8.9. For June 4 through 10 they were between 0 and 2 with a mean of 0.3 AR

WWV USER SURVEY Fm ARRL HR Propagation Forecast Bulletin NR 22

WWV is conducting a user survey. If you would like to participate, write or call the Time and Frequency Division, National Bureau of Standards, 325 Broadway, Boulder, CO 80303. Ask for the WWV user survey forms. Send them back promptly in the postage paid envelope you will receive with the forms.

HR ARRL Bulletin NR 47 From ARRL Headquarters Newington CT - June 11, 1987

Relayed by KB8NW/OBS via BARF80 BBS - To All Radio Amateurs BT

The ARRL has filed comments in FCC General Docket 87 107, the FCC proposal concerning input selector switches for televisions. This switch would permit the viewer to alternate between receiving television channels on his cable system or receiving local over the air channels directly. The FCC had proposed to require that this switch meet a number of technical standards, including an isolation factor of approximately 60 DB.

In its comments, the ARRL urged stricter standards for these switches to help avoid interference to amateurs from cable signal leakage or to cable subscribers from amateur interference. The ARRL said that its discussions with the National Cable Television Association had revealed that switches are available which are capable of 90 DB of isolation. The ARRL comments state that this degree of isolation should be required at minimum. Furthermore, the problem of cable interference also extends to all cable components that terminate at the television, such as matching transformers, connectors and cables, and to the television itself.

In conclusion, the ARRL has urged FCC not to adopt the proposed 60 DB standard for these switches, but to adopt the 90 DB standard which present technology already permits AR

NORTH COAST AMATEUR RADIO CLUB MEMBERSHIP RENEWAL IS NOW DUE

If you have not already done so, please send in your NCARC membership renewal form along with your dues for the upcoming membership year. The NCARC membership year is from July 1 thru June 30.

A membership renewal was included in your last North Coast Communicator, as well as one is also provided in this issue. Thank you for your continued support.

HR ARRL Bulletin NR 46 From ARRL Headquarters Newington CT - June 9, 1987
Relayed by KB8NW/OBS via BARF80 BBS - To All Radio Amateurs - BT

The following have been elected without balloting as Section Managers for their respective sections. Georgia K4JNL Sacramento Valley W6IEW Southern Texas W5KR Washington KR7L and West Virginia K8KT. Those elected begin their new term of office October 1, 1987 AR

HR ARRL Bulletin NR 45 From ARRL Headquarters Newington CT - June 9, 1987
Relayed by KB8NW/OBS - To All Radio Amateurs - BT

Amateur radio commemoration of the bicentennial of the US Constitution began in Washington DC and Philadelphia PA on May 25. These same locations will air special event activities on National Independence Day, July 4. The times and frequencies will approximate those listed on page 90, May 1987 QST, under the heading, Washington DC. Listen for NN3SI, W3DOS and K3MTK. The three stations will use /200 after the call letters. Special QSL cards will be offered for the May 25, July 4 and later celebrations in each of the original 13 states. Watch QST as well, especially the September 1987 issue, for other information on the bicentennial of the US Constitution AR

HR ARRL Bulletin NR 44 From ARRL Headquarters Newington CT - June 2, 1987
Relayed by KB8NW/OBS via BARF80 BBS - To All Radio Amateurs - BT

The Radio Society of Great Britain advises that effective June 1, 1987, British Amateurs are authorized to use the entire 50 to 52 MHz band. 100 watts ERP, horizontal polarization only, 20 meter antenna height, no mobile, portable or alternate fixed locations permitted AR

HR ARRL Bulletin NR 43 From ARRL Headquarters Newington CT - May 28, 1987
Relayed by KB8NW/OBS via BARF80 BBS - To All Radio Amateurs - BT

The Forest Service has proposed new fee schedules for the various radio and television services, including amateur radio, who presently rent US Forest Service land sites in the Midwest, West, Central and some Eastern states for repeater, microwave or other radio uses. The areas affected are in the Eastern, Northern and Rocky Mountain regions of The Forest Service. Presently, a number of amateur radio repeaters are located at these sites, which are rented for 50 to 100 dollars yearly.

Complicating matters is that each region has proposed a different fee schedule. The largest increase has been proposed by the Rocky Mountain region which would raise repeater rentals to 1000 dollars. This region consists of sites in Kansas, Nebraska, South Dakota, Wyoming and Colorado. The Northern region has proposed minimum fees of 150 and the Eastern region, 200 dollars.

There are nine Forest Service regions, and there is a possibitity that other regions will shortly propose site rental increases. For further details on these proposals can be found in the March 31, April 30 and May 4 editions of The Federal Register, in the May 21 issue of The ARRL Letter, and in The Happenings column of July QST AR

HR ARRL Bulletin NR 42 From ARRL Headquarters Newington CT - May 22, 1987
Relayed by KB8NW/OBS - To All Radio Amateurs - BT

The ARRL Executive Committee met May 16 in Birmingham, Alabama. The committee reviewed present and future ARRL actions designed to mount the strongest possible defense against the FCC proposal to take away the bottom two mhz of the 220 mhz band from the Amateur Service. The committee authorized ARRL counsel to investigate the various alternatives regarding the FCC inquiry in PRB 3, which would permit the private sector to issue certain amateur callsigns and to determine possible tax and liability consequences. The committee also authorized the filing of comments against the proposals by the Forestry Service to raise rental fees for its repeater and telecommunications sites, and reviewed other FCC matters including a future request for special temporary authority to FCC regarding developent of HF packet networks. Thomas Atkins, VE3CDM, was named chairman of the AD HOC Committee on amateur radio and the media, and the committee reviewed a progress report on the proposed visitors center. Complete minutes of the executive committee meeting will appear in July QST AR has already developed and has been reported by spotters or indicated by radar. Warnings are statements of imminent danger and are issued for relatively small areas near and downstream from the severe storm or flood.

Watch

(Issued for tornado, severe thunderstorm, flash flood.) A watch identifies a relatively large area in which flash floods or severe storms might occur. Watches are quite often issued before any severe weather has developed. Severe thunderstorm and tornado watches usually include an area 140 miles wide by about 200 miles long. *The watch is only an indication of where and when the severe weather probabilities are highest, and should not be confused with a warning.*

SkyWarn Repeaters by County

Cuyahoga	146.760	-600 input
Geauga	147.015	+600 input
Lake	147.210	+600 input
Lorain	147.150	+600 input
Medina	147.030	+600 input
Summit	146.640	-600 input

SKYWARN

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THE W5YI REPORT, Dits & Bits, Vol 9 #11 - 06/01/87
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"Instant Novice" Rulemaking Possible

The Commission has received another request for "instant Novice" privileges. Frederick G. Hambrecht, KJ4EJA, of Jamestown, Tennessee, filed a Petition for Rulemaking on April 27, 1987, seeking to "Amend the Amateur Radio Service Rules to Permit Volunteer Examiners Conducting the Novice Operator Examination to Authorize Immediate Operation if Examinee Passes the Examination."

The FCC assigned the petition RM-5924 and assigned a 30 day comment period -- which closes on June 20. We discussed the matter with the FCC's Ray Kowalski last Friday. Ray oversees the Amateur Radio Service through his position as Special Services Division Chief.

"We keep getting that suggestion...and we keep turning it down. What we are ^doing now is putting it out for preliminary comment to determine if what we really ought to do is to proceed towards proposed rulemaking. At any given time, we seem to have someone petitioning for "instant Novice" privileges.

I asked Ray what would an "instant Novice" use for a call sign. "We thought that perhaps the call sign could be the call sign of the person who gave them the examination with a suffix," he said.

Kowalski said he was "very interested" in learning how the amateur community feels about Novice operators being able to get on the air at once without having to wait for arrival of their license.

Your comments (original and five copies) on the "instant Novice" matter should be sent to: FCC, Office of the Secretary, 1919 M Street NW, Washington, DC 20554. Be certain to refer to RM-5924.

Spotter Reporting Procedures

- From radio-equipped vehicles, report severe weather observations to a central collection point and request them to relay the report to the National Weather Service.
- Law enforcement and Civil Defense spotters—report to the National Weather Service via NAWAS, radio, or other direct communications links as prescribed by your Emergency Operations Plan.
- When the telephone is your only communications method, call your primary or alternate contact and ask them to relay your report to the National Weather Service.

If you are unable to reach the primary or alternate contact, place an emergency call through the telephone operator to the National Weather Service. If the call is long distance, it can be made collect. Report promptly as the storm may interrupt communications.

REPORT BRIEFLY:

What you have seen: wall cloud, tornado, funnel cloud, waterspout, heavy rain, etc.

Where you saw it: the direction and distance from a known location, e.g., 3 miles south of Beltsville.

When you saw it: make sure you note the time of your observation.

What it was doing: describe the storm's direction and speed of travel, size and intensity, and destructiveness. Include any amount of uncertainty as needed, i.e., "funnel cloud; no debris visible at the surface but too far away to be certain it is not on the ground."

Identify yourself and your location. Give spotter code number if one has been assigned.

Report:

1. Tornado, Funnel Cloud, Waterspout, or Wall Cloud
2. Hail, ¼ inch or larger
3. Damaging Winds (usually 50 mph or greater)
4. Flash Flooding
5. Rain, (rate of 1 inch per hour or more)

Additional Tips for Skywarn Spotters

- The first sign of a tornado may not be a funnel at the cloud base. Your first clue may be debris or dust at the surface, so be alert to events at ground level, as well as in the clouds.
- At night, lightning flashes can aid in identifying the Rain Free Base, Wall Cloud, and Precipitation Area. Although a loud roar is frequently associated with a tornado, strong straight-line winds can also produce such a sound.
- If you spot from a fixed location, use a map to determine distances and directions to known landmarks such as water towers, TV towers, etc. This will help you estimate distance and direction in your reports. Mobile spotters should always have up-to-date maps and be familiar with the area in which they are operating.
- When available, use binoculars to look for rotation and other cloud features. Once you spot a funnel, tornado, or wall cloud, be alert for the formation of others in the area.
- If you find yourself in large hail, remember you are in or near the area where tornado formation is most likely in a tornadic thunderstorm.
- Always follow the basic safety rules. In open country, a spotter may be able to use his knowledge of the tornado's motion and available escape routes to drive away from the tornado safely. In urban areas this is usually not possible because of traffic congestion. Make certain your family knows what to do in tornado emergencies as you may not be available to assist or direct them.

Spotter Aids

ESTIMATING HAIL SIZE:

pea size ¼ **inch;** marble size ½ **inch;** dime size ¾ **inch;** quarter size **1 inch;** golfball size **1.75 inch;** baseball size **2.75 inch.**

ESTIMATING WIND SPEEDS*
(miles per hour)

25-31	Large branches in motion; whistling heard in telephone wires
32-38	Whole trees in motion; inconvenience felt walking against wind
39-54	Twigs break off trees; wind generally impedes progress
55-72	Damage to chimneys and TV antenna; pushes over shallow rooted trees
73-112	Peels surface off roofs; windows broken; light trailer houses pushed or overturned; moving automobiles pushed off roads
113-157	Roofs torn off houses; weak buildings and trailer houses destroyed; large trees snapped and uprooted
158 & up	Severe damage; cars lifted off ground

* *Adapted from the Beaufort and Fujita Wind Scales.*

National Weather Service
Storm Spotter's Glossary and Supplemental Guide

Accessory Clouds

Clouds that are dependent on a larger cloud system for development and continuance. Accessory clouds associated with the thunderstorm include roll, shelf, mammatus, and wall clouds.

Anvil

The spreading of the upper portion of a cumulonimbus cloud into an anvil-shaped plume usually of fibrous or smooth appearance. Strong or severe thunderstorms often have thicker anvils with the side and bottom having a cumuliform or slowly boiling appearance in the immediate vicinity of the parent cumulonimbus.

Collar Cloud

Frequently used as a synonym for a wall cloud although it actually is a generally circular ring of cloud surrounding the upper portion of a wall cloud.

Cumulonimbus Cloud

The parent cloud of a thunderstorm. The cumulonimbus cloud towers above ordinary cumulus clouds, with stronger or severe storms often having a more sharply outlined "hard" appearance with relatively rapid rising motions visible. The cloud's upper portion includes the anvil. Accompanying precipitation is often heavy and the usual occurrence of lightning and thunder with these clouds leads to the popular names of thunderhead or thundercloud. See also *Thunderstorm.*

Cumulus Cloud

A column of rising air that has condensed into a dense, nonfibrous cloud with distinct outlines, appearing much like a rising mound, a dome, or cauliflower. The base of the cloud is relatively flat and dark, while the tower is usually white and sunlit. The cumulus cloud is the first stage of a developing thunderstorm, although most cumulus do not form thunderstorms.

Downdraft

A column of generally cool air that rapidly sinks to the ground, most often accompanied by precipitation in a shower or thunderstorm. Areas of downdraft usually contain little cloud, and what clouds that may be present are typically dissipating.

Flanking Line

A line of cumulus connected to and extending outward from the most active portion of a parent cumulonimbus, usually found on the southwest side of the storm. The cloud line has roughly a stair step appearance with the taller clouds adjacent to the parent cumulonimbus. It is most frequently associated with strong or severe thunderstorms.

Flash Flooding

Flooding that develops very quickly on streams and river tributaries usually as a result of thunderstorms. Sometimes the onset of flash flooding comes before the end of heavy rains. There is little time between the detection of flood conditions and the arrival of the flood crest. Swift action is essential to the protection of life and property.

Front

A transition zone between two differing air masses. Basic frontal types are (1) *COLD FRONT* where cooler air advances replacing warmer air; (2) *WARM FRONT*—warmer air advances replacing cooler air; (3) *STATIONARY FRONT*—warmer air meeting cooler air with neither air mass moving appreciably. Thunderstorms can form in association with any of these fronts. However, fronts are *not* necessary for thunderstorm development.

Funnel Cloud

A funnel-shaped cloud extending from a towering cumulus or cumulonimbus base. It is associated with a rotating air column that is not in contact with the ground. The cloud is a tornado if a ground-based debris or dust whirl is visible below the funnel aloft.

Gust Front

The leading edge of the thunderstorm downdraft air. The gust front is most prominent beneath the rain-free base and on the leading edge of an approaching thunderstorm. It is usually marked by gusty, cool winds, and sometimes blowing dust. The gust front often precedes the thunderstorm precipitation by several minutes. The shelf or roll cloud sometimes accompanies the gust front, especially when the gust front precedes a line of thunderstorms.

Hail

Precipitation in the form of balls or clumps of ice, produced by thunderstorms. Severe storms with intense updrafts are the most likely large hail producers.

Hook Echo

A radar pattern sometimes observed in the southwest quadrant of a tornadic thunderstorm. Appearing like the number six or a fishhook turned in toward the east, the hook echo is precipitation aloft around the periphery of a rotating column of air 2-10 miles in diameter. The hook echo is often found in a local area favorable for tornado development. However, many tornadoes occur without a hook echo and not all hook echoes produce tornadoes.

Lightning

Any and all of the various forms of visible electrical discharge caused by thunderstorms. Severe thunderstorms usually have very frequent and sometimes nearly continuous lightning. However, some non-severe thunderstorms also contain frequent and vivid electrical displays, while some severe storms are accompanied by little lightning.

Mamma Clouds

Also called mammatus, these clouds appear as hanging, rounded protuberances or pouches on the under surface of a cloud. With thunderstorms, mammatus are seen on the underside of the anvil. These clouds do *not* produce tornadoes, funnels, hail, or any other type of severe weather, although they often accompany severe thunderstorms.

Precipitation Shaft

A visible column of rain and/or hail falling from a cloud base. When viewed against a light background, heavy precipitation appears very dark gray, sometimes with a turquoise tinge. This turquoise tinge has been commonly attributed to hail but its actual cause is unknown.

Rain-Free Base

A horizontal, dark cumulonimbus base that has no *visible* precipitation beneath it. This structure usually marks the location of the thunderstorm updraft. Tornadoes most commonly develop (1) from wall clouds that are attached to the rain-free base, or (2) from the rain-free base itself. This is particularly true when the rain-free base is observed to the south or southwest of the precipitation shaft.

River Flood

Usually occurs on rivers, after flash flooding has occurred on streams and tributaries. River floods develop and reach their peak more slowly than flash floods. In many cases, the river flood peak occurs after the rain has ended.

Roll Cloud

A relatively rare, low-level, horizontal, tube-shaped accessory cloud completely detached from the cumulonimbus base. When present, it is located along the gust front and most frequently observed on the leading edge of a line of thunderstorms. The roll cloud will appear to be slowly "rolling" about its horizontal axis. Roll clouds are *not* and do *not* produce tornadoes.

Scud Clouds

Low cloud fragments often seen in association with and behind thunderstorm gust fronts. These clouds are ragged and wind torn and are not usually attached to the thunderstorm base. Scud clouds do not produce severe weather. In some cases, when scud clouds are attached to the thunderstorm base they can be mistaken for wall clouds or tornadoes.

Severe Thunderstorm

A thunderstorm that goes from the mature stage to the severe stage before dissipating. Severe thunderstorms are most efficient "machines" because the updraft remains strong for a long time. They also occasionally contain rotation on a broad scale. Because of its structure. the severe storm may last for hours beyond the lifetime of a normal thunderstorm while producing large hail, high winds, torrential rain, and possible tornadoes. Officially, a thunderstorm is classified as severe if 50 knot (58 mph) winds are measured, ¾ inch or larger hail occurs, or funnel clouds or tornadoes develop.

Straight Winds

Winds associated with a thunderstorm, most frequently found with the gust front. These winds originate as downdraft air reaches the ground and rapidly spreads out, becoming strong horizontal flow. Damaging straight winds, although relatively rare themselves, are much more common than are tornadoes.

Shelf Cloud

A low-level horizontal accessory cloud that frequently appears to be wedge-shaped as it approaches. It is usually attached to the thunderstorm base and forms along the gust front. The leading edge of the shelf is often smooth and at times layered or terraced. It is most often seen along the leading edge of an approaching line of thunderstorms, accompanied by gusty straight winds as it passes overhead and followed by precipitation. The underside is concave upward, turbulent, boiling, or wind-torn. Tornadoes rarely occur with the shelf cloud.

Squall Line

Any line or narrow band of active thunderstorms. The term is usually used to describe solid or broken lines of strong or severe thunderstorms.

Tail Cloud

A low tail-shaped cloud extending outward from the northern quadrant of a wall cloud. Motions in the tail cloud are toward the wall cloud with rapid updraft at the junction of tail and wall cloud. This horizontal cloud is not a funnel or tornado.

Thunderstorm

A local storm (accompanied by lightning and thunder) produced by a cumulonimbus cloud, usually with gusty winds, heavy rain, and sometimes hail. Non-severe thunderstorms rarely have lifetimes over two hours. A typical, non-severe thunderstorm life cycle consists of three stages: (1) *CUMULUS STAGE*—warm, moist air rises (updraft) and condenses into tiny water droplets which make up the visible cloud. (2) *MATURE STAGE*—the cloud grows above the freezing level; precipitation forms and becomes heavy enough to fall back to earth. This precipitation generates cool air which also sinks back to earth with the precipitation. (3) *DISSIPATION STAGE*—Cool rain and downdraft spread throughout the storm replacing the updraft which is the lifeblood of the thunderstorm. The visible cumulonimbus cloud becomes softer in appearance, less distinctly outlined or "fuzzy" and dissipates, sometimes leaving only the high anvil cloud, as the storm rains itself out.

Tornado

A violently rotating narrow column of air in contact with the ground and extending from a thunderstorm base. The tornado is most often found in the southwest quadrant of the storm, near the trailing edge of the cumulonimbus cloud. Tornadoes and funnel clouds are usually pendant from (1) wall clouds or (2) directly from the thunderstorm base, within a few miles to the southwest of the precipitation shaft. The spinning moton of a tornado is most often left to right on the front side and right to left on the backside (counterclockwise). Tornadoes have been called twisters and cyclones, but these words are all synonyms for the most violent storm on earth, with estimated wind speeds up to 300 mph.

Updraft

Warm moist air which rises and condenses into a visible cumulus or cumulonimbus cloud. Once the cloud forms, it depends on the updraft for continuance and further development.

Virga

Wisps or streaks of rain falling out of a cloud but not reaching the earth's surface. When seen from a distance, these streaks can be mistaken for funnels or tornadoes.

Wall Clouds

A local and often abrupt lowering of a rain-free cumulonimbus base into a low-hanging accessory cloud, from 1 to 4 miles in diameter. The wall cloud is usually situated in the southwest portion of the storm below an intense updraft, marked by the main cumulonimbus cloud and associated with a very strong or severe thunderstorm. When seen from within several miles, many wall clouds exhibit rapid upward motion and rotation in the same sense as a tornado, except with considerably slower speed. *A rotating wall cloud usually develops before tornadoes or funnel clouds by a time which can range from a few minutes up to possibly an hour.* Spotters should key on any lowering of the cumulonimbus base as suspect wall cloud, particularly when it is located southwest of the precipitation shaft. Wall clouds should be reported. NOTE: Sometimes other low-hanging accessory clouds are mistakenly identified as wall clouds.

Warning

(Issued for tornadoes, severe thunderstorm, flash flood, river flood.) A warning is issued when severe weather

Jun 18, 1987

North Coast Amateur Radio Club
General Membership Roster

	Call	CL	Name	Street Address	City and State	Telephone	
001.	KB8A	E	Dan Sarama	15591 Rademaker Blvd.	Brook Park, OH 44142	267-5083	
002.	K8AAI	A	Bob Turek	2150 W. 105th St.	Cleveland, OH 44102	-	UL
003.	W8ADV	G	Martin (Ray) Smith	16927 Chatfield Ave.	Cleveland, OH 44111	252-6151	
004.	WL7AEC	G	Tom Tetzlaff	5341 Cornell Ave.	N. Ridgeville, OH 44039	1-327-6020	
005.	N9AGC	A	Greg Smith	5115 Lake Rd., Apt. 1019	Sheffield Lake, OH 44054	1-949-8545	
006.	KB8AII	T	Pat Lavelle	16532 St. Anthony Lane	Cleveland, OH 44111	252-0327	
007.	WD8AJF	A	Dan Wadsworth	11028 Hawke Rd.	Columbia Station, OH 44028	1-748-2816	
008.*	KB8AK	A	Pat Willemin	331 Courtland St.	Elyria, OH 44035	1-324-4574	
009.	N8API	T	George Keco	P.O. Box 442	Brunswick, OH 44212	225-8709	
010.	N8ATV	A	Jerry Jarze	9261 Nicholes Rd.	Freedom Twp., OH 44288	-	
011.	N8AUH	G	Dave Kersten	2197 McKinley Ave.	Lakewood, OH 44107	221-6740	
012.	K8AZ	E	Tom Lee	7275 Surrey Lane	Chesterland, OH 44026	729-8104	
013.	WA8AZO	G	Joe Trost	412 Douglas Blvd.	Richmond Hts., OH 44143	481-7683	
014.	KK8B	E	Denny Filka	6324 Mandalay Dr.	Parma Hts., OH 44130	884-1175	
015.	KB8BBU	N	Jerry Hess	3682 W. 140th St.	Cleveland, OH 44111	252-0747	
016.	W1BBW	G	Shelly Shillingburg	667 Washington Ave.	Barberton, OH 44203	1-753-9314	
017.	KB8BBZ	T	Edmund Smith	6100 Wallace Blvd.	N. Ridgeville, OH 44039	1-327-9285	
018.*	KB8BDY	N	Nick Szabo	6142 Eavenson	Brook Park, OH 44142	-	UL
019.	KB8BEB	T	Ron Deatherage	28410 Magnolia Dr.	North Olmsted, OH 44070	235-2882	
020.	K8BJA	A	Richard Flarida	2267 State Route 183	Atwater, OH 44201	1-947-2874	
021.	KA8BJA	A	Frank Stevison	32137 Dickerson Rd.	Willowick, OH 44094	944-4843	
022.	W1BKZ	E	Pete Harmon	35400 Euclid Ave. #A-204	Willoughby, OH 44094	951-9360	
023.	KE8BN	A	Mark Dunkel	550 Kenilworth Rd.	Bay Village, OH 44140	835-3372	
024.	KB8BNC	G	Ron Park	6460 Brecksville Rd.	Independence, OH 44131	-	UL
025.	N8BO	E	Charlie Cook	2792 Friar Dr.	Parma, OH 44134	842-4232	UL
026.	WB8BPA	G	Don Hill	2005 Marlindale Rd.	Cleveland Hts., OH 44118	932-8050	
027.*	KB8BPR	N	Patricia Walker	1204 Tulip Ct.	Brunswick, OH 44212	225-1744	UL
028.	KA8BPU	G	Ray Becker	5911 Bradley Ave.	Parma, OH 44129	842-7647	
029.	KB8BSC	T	John Kilner	13749 Bagley Rd.	Middleburg Hts., OH 44130	845-0546	UL
030.	N8BTB	A	Steve Stevison	14106 Terminal Ave.	Cleveland, OH 44135	476-2939	
031.	K8BVI	A	Art Anzic	28491 Elder Dr.	North Olmsted, OH 44070	235-4077	
032.	N8BYW	G	Bud Riess	317 Sheri Ln.	Brunswick, OH 44212	225-7417	
033.	AE8C	E	Sy Maruszan	4207 Kenmore Ave.	Parma, OH 44134	886-3712	
034.	W8CDL	G	Rev. David Vizsolyi	9183 Broadview Rd.	Broadview Hts., OH 44147	526-1177	
035.	W8CEJ	A	Mel Hoffman	5579 Nathan Ave.	Parma, OH 44130	885-3303	
036.	W8CEM	A	Chuck Perry	2833 Walter Rd.	North Olmsted, OH 44070	777-3157	
037.	W8CHA	G	Steve Molnar	15721 Westdale Ave.	Cleveland, OH 44135	252-7019	
038.	WD8CHL	T	Jim Barbour	5717 S. Nantucket #211	Lorain, OH 44053	1-282-3044	
039.	KB8CI	A	Tom Kryza	10620 Fidelity Ave.	Cleveland, OH 44111	671-7199	
040.	KB8CJQ	N	Starrett Rose	4955 Lansing Dr.	North Olmsted, OH 44070	777-3380	
041.	N8CKV	A	Paul Langendorfer	7784 Columbia Rd.	Olmsted Falls, OH 44138	235-1458	
042.	KA8CKZ	A	Bill Jones	11313 Linnet Ave.	Cleveland, OH 44111	941-3850	UL
043.	N8CQD	G	Bill Maerkle	22940 Mastick Rd.	Fairview Park, OH 44126	779-7311	
044.	KE8CT	A	Pete Incaini	8175 Royal Ridge Dr.	Parma, OH 44129	885-5436	
045.*	WA8CTU	G	Al Trost	412 Douglas Blvd.	Richmond Hts., OH 44143	481-7683	
046.	K8CVZ	T	Ed Hilderbrand	4110 Fenn Rd.	Medina, OH 44256	1-723-2718	
047.	W8CWT	A	Ken Good	5103 Broadway Ave.	Lorain, OH 44052	1-233-6510	
048.	N8DAD	T	Barbara Ernest	12313 Kensington Ave.	Cleveland, OH 44111	941-2271	
049.	K8DBG	T	Dick W. Stuart	4498 Briarbanks Dr.	Fairview Park, OH 44126	331-8591	
050.	K8DBN	E	Bill Rieke	1440 E. Melrose	Westlake, OH 44145	333-6644	

051.	K8DDY	G	Bill Schreiber	6 Sunrise Blvd.	Olmsted Twp., OH 44138	235-3913	
052.*	KE8DJ	A	Diane Willemin	331 Courtland St.	Elyria, OH 44035	1-324-4574	
053.	N8DMK	E	Russ Pratley	12711 Broadway	Garfield Hts., OH 44125	-	UL
054.	N8DPZ	T	Bob Rieke	20943 Eastwood Ave.	Fairview Park, OH 44126	331-1051	
055.	K8DTS	A	Bob Leskovec	25884 Highland Rd.	Richmond Hts., OH 44143	486-5833	UL
056.	WB8DTY	A	Tommie Murray	P.O. Box 08097	Cleveland, OH 44108	486-0033	
057.	KE8DX	A	Dick Foster	6817 Franke Rd.	Middleburg Hts., OH 44130	676-0165	
058.	WA8DYL	G	Eugene Likes	4162 Canterbury Rd.	North Olmsted, OH 44070	734-7648	UL
059.	KB8DZ	A	Joe Noga	36171 Kinzel Rd.	Avon, OH 44011	1-934-6291	
060.	N8DZO	T	Jack Zigon	P.O. Box 347001	Parma, OH 44134	351-2427	
061.	W8EFW	E	Paul Cornell	1340 Ford Rd.	Lyndhurst, OH 44124	442-7024	
062.	N8EIJ	G	Ken Poling	4707 Martin Dr.	North Olmsted, OH 44070	777-8785	
063.	W8EPM	T	Joe Rozek	28405 North Park Dr.	North Olmsted, OH 44070	777-5574	
064.	KD8EQ	A	Dick S. Stuart	26921 Elizabeth Ln.	Olmsted Twp., OH 44138	235-2323	
065.	WA8ERA	T	Lee Georgia	5106 Montauk Ave.	Parma, OH 44134	888-5286	UL
066.	W8ETC	G	Len Hettinger	3087 W. 115th St.	Cleveland, OH 44111	251-5936	
067.	N8ETP	T	Tom Kopcak	1497 Canterbury Rd.	Westlake, OH 44145	871-6181	UL
068.	N8ETQ	A	Dan Harlan	3418 Stanfield Dr.	Parma, OH 44134	845-5442	
069.	N8ETW	G	Ernie Nagy	35892 Poplar St.	North Ridgeville, OH 44039	1-327-6849	
070.	N8ETY	A	Dave Kifer	10720 Aaron Dr.	Parma, OH 44130	885-2131	
071.*	N8ETZ	A	Mary Nagy	35892 Poplar St.	North Ridgeville, OH 44039	1-327-6849	
072.	KA8EVS	G	Charlie Stien	4652 East 85th St.	Garfield Hts., OH 44125	-	UL
073.	KD8EX	A	Tom Rudman	32651 Redwood Blvd.	Avon Lake, OH 44012	1-933-8753	
074.	KC8F	E	Heinz Wimmer	26976 Fairfax Lane	North Olmsted, OH 44070	734-6890	
075.	W8FAZ	E	Joe Zelle	24124 Glenbrook Blvd.	Euclid, OH 44117	531-1597	
076.	N8FCX	A	Ron Packard	4931 Wake Robin Rd.	Mentor, OH 44060	1-257-2541	
077.	N8FDY	A	Tom Wilkinson	1337 Sloane Ave.	Lakewood, OH 44107	521-9519	
078.	N8FEG	G	Pete Gramuglia	6380 Elmdale	Brook Park, OH 44142	676-9027	
079.	N8FGR	T	Wayne Pipoly	4350 Lander Rd.	Orange Village, OH 44022	831-8003	
080.	N8FIL	T	Rich James	7620 Crestwood Ln.	Northfield Center, OH 44067	467-0493	UL
081.	N8FKS	T	Don Summer	26915 Westwood Ln.	Olmsted Twp., OH 44138	235-6295	
082.	N8FKT	A	Bob Bassett	P.O. Box 07128	Lakewood, OH 44107	-	UL
083.*	KA8FOE	T	Pauline Wells	5955 Burns Rd.	North Olmsted, OH 44070	779-8999	
084.	WA8FOV	G	Ted Ermi	25895 John Rd.	Olmsted Twp., OH 44138	235-2698	
085.	N8FQQ	T	Tom Adams	11400 Linnet Ave.	Cleveland, OH 44111	251-3080	
086.	N8GJR	A	Jim Nestor	39114 Route 303	Grafton, OH 44044	1-355-8697	
087.	WB9GMO	G	Mike Hammel	2611 Shoreland Ave #7	Toledo, OH 43611	1-419-729-2323	
088.	W8GNB	G	Ed Ehrbar	4307 W. 137 St.	Cleveland, OH 44135	251-8234	
089.	N8GNJ	T	Steve Stroh	917 Salem Ave.	Elyria, OH 44035	1-365-2793	
090.	N8GNL	T	John Jailer	5685 Hickory Trail	North Ridgeville, OH 44039	1-327-7088	
091.*	HR3GS	1	Gladis Shillingburg	667 Washington Ave.	Barberton, OH 44203	1-753-9314	
092.	WA8GZC	T	Marion Hill	8384 Barton Dr.	Strongsville, OH 44136	238-1152	
093.	N8HAD	T	Skip Hockensmith	6229 Elmdale	Brook Park, OH 44142	267-9374	
094.	N8HHE	A	Rob Szule	6032 Porter Rd.	North Olmsted, OH 44070	734-5963	
095.	N8HJJ	T	Jim Schmitz	34770 Schwartz Rd.	Avon, OH 44011	1-937-5436	
096.	N8HOB	G	Paul Hoegstrom	5962 S. Park Blvd.	Parma, OH 44134	884-8398	
097.*	N8HPV	T	Elizabeth Nagy	35892 Poplar St.	North Ridgeville, OH 44039	1-327-6849	
098.*	N8HSE	T	Nan Kersten	2197 McKinley Ave.	Lakewood, OH 44107	221-6740	
099.*	N8HTX	T	Monica James	7620 Crestwood Ln.	Northfield Center, OH 44067	467-0493	UL
100.	N8HUR	T	Carl Beduhn	14411 Tabor Ave.	Maple Heights, OH 44137	663-8376	UL
101.	N8HVQ	T	Jack Andrisin	7730 Fleger Dr.	Parma, OH 44134	845-0068	
102.	N8HWK	G	Larry Galt	434-D West Lake St.	Addison, IL 60101	1-312-543-7132	
103.	N8HWP	T	Evelyn Godwin	882 Oelley Dr.	Cleveland, OH 44109	351-2463	
104.	N8IAA	T	Larry E. Tews	3341 W. 131 St.	Cleveland, OH 44111	476-8164	

105.	N8IAN	G	Tom Donovan	2814 Commonwealth	Parma, OH 44134	843-6969	UL
106.	N8IAR	T	Bob Hays	3410 Wooster Rd. Apt 102A	Rocky River, OH 44116	331-8190	
107.	N8IAX	G	Cody Williams	9976 Fairtree Dr.	Strongsville, OH 44136	238-6034	
108.	N8IAZ	T	Terry Holstein	8422 Lorraine Dr.	Strongsville, OH 44136	238-0999	
109.	N8ICD	T	Cliff Crabs	25575 Butternut Ridge Rd.	North Olmsted, OH 44070	777-4025	UL
110.	W3IGI	T	Bill Spring	389 Brantley Ln.	Brunswick, OH 44212	273-5723	
111.	W7IJ	E	Bill Rohrer	2235 Elmwood Dr.	Westlake, OH 44145	892-9472	
112.*	N8ILL	T	Mary Lou Sarama	15591 Rademaker Blvd.	Brook Park, OH 44142	267-5083	
113.	KA8IMU	A	Tony Romano	4837 E. 84th St.	Garfield Hts., OH 44125	271-6954	
114.	WA8IMO	A	Bob Sull	230 Moore Rd.	Avon Lake, OH 44012	1-933-4582	
115.	WD8INK	G	Ken Wiggenhorn	2134 Brown Rd.	Lakewood, OH 44107	221-9954	
116.	WD8INO	G	Steve Ferraro Jr.	3417 Marmore Ave.	Parma, OH 44134	741-2547	
117.	W8IO	E	Robert Allen	23305 Westchester Dr.	North Olmsted, OH 44070	734-0570	
118.	WD8IQO	T	Milt Kujawinski	4235 W. 50th St.	Cleveland, OH 44144	749-5519	
119.	WD8IRG	A	Van Winkle	16417 Shelby Dr.	Brook Park, OH 44142	267-9063	
120.	WD8ISB	E	Dick Dell	8085 Wren Dr.	Macedonia, OH 44056	467-7733	UL
121.	KR0J	E	Jeff Vecbastiks	3289 W. 41 St.	Cleveland, OH 44109	631-6087	UL
122.	N6JAM	T	Ron Lew	473 Snavely Rd.	Richmond Hts., OH 44143	381-3832	
123.	WD8JMM	G	Alex Manuk	3339 Scranton Ave. (UP)	Cleveland, OH 44109	741-4472	
124.	KD8JQ	E	Don Jason	715 Twin Oaks Blvd.	Medina, OH 44256	1-723-5492	
125.	W8KBV	G	Joe Young	2218 E. 93rd St.	Cleveland, OH 44106	721-6397	UL
126.	W8KGA	G	Larry J. Stacik	12503 Carrington Ave.	Cleveland, OH 44135	941-4711	
127.	WD8KHU	T	Mark Woodworth	20239 Bonnie Bank Blvd.	Rocky River, OH 44116	331-6347	
128.	KC8KI	A	John Baddour	2801 Clague Rd.	North Olmsted, OH 44070	734-3778	
129.*	WD8KTC	T	Marie Johnson	6504 Edgehurst Dr.	Brook Park, OH 44142	676-5342	
130.	KA8LIH	T	Karen Counter	22560 Morton Ave. Apt #10	Fairview Park, OH 44126	779-4397	
131.	N8LL	E	Jim Schwabe	3050 Farnham Rd.	Richfield, OH 44286	1-659-9841	
132.	WD8LRZ	G	Larry Lanning	3528 Monte Vista Dr.	Brunswick, OH 44212	225-4607	
133.	W8LWY	A	John Mack	24601 Mitchell Dr.	North Olmsted, OH 44070	734-8917	
134.	AI8M	E	Dave Willemin	331 Courtland St.	Elyria, OH 44035	1-324-4574	
135.	KV8M	E	Tom Kapsar	15517 Prospect Rd.	Strongsville, OH 44136	238-6150	
136.	NO8M	E	Steve Wolf	27132 Butternut Ridge Rd.	North Olmsted, OH 44070	777-1177	
137.	K8MBZ	A	Dave Jones	7630 Main St.	Olmsted Falls, OH 44138	235-3269	
138.	K8MDC	T	Fred Jones	8174 Olmway Ave.	Olmsted Falls, OH 44138	235-3260	
139.	K8MGH	G	Lou Pierce	6344 Ridgeview Blvd.	N. Ridgeville, OH 44039	1-327-2206	
140.	WD8MHL	G	Ray G. Maskow	10401 Linnet Ave.	Cleveland, OH 44111	671-0317	
141.	WD8MHR	A	Eric Benedict	12470 Albion Rd.	N. Royalton, OH 44133	237-8720	
142.	K8MO	E	Jeff Safran	17781 Walnut Dr.	Strongsville, OH 44136	572-3509	UL
143.	W8MW	E	Maynard Weston	4564 Park Edge Dr.	Fairview Park, OH 44126	734-4260	
144.	WB8NAQ	A	Bill Reed	3334 Brookdale Ave.	Parma, OH 44134	741-7071	UL
145.	KB8NW	A	Tedd Mirgliotta	16806 West 130 St.	Strongsville, OH 44136	237-2816	
146.	WA8NXT	G	Ferd Nye Jr.	31497 Hilliard Blvd.	Westlake, OH 44145	871-8098	
147.	WB8NXT	A	Neil Johnson	6504 Edgehurst Dr.	Brook Park, OH 44142	676-5342	
148.	NQ8O	E	Tom Tillack	2603 Oakdale Ave.	Lorain, OH 44055	1-244-5647	
149.	WD8OCI	T	Bob Bentley	4800 Henry St. Apt. #103	Garfield Hts., OH 44125	581-7303	UL
150.	WD8OMW	A	Glenn Christman	1295 Summit Ave.	Lakewood, OH 44107	221-6538	
151.	K8OPV	T	George Hodapp	13101 Yager Dr.	Strongsville, OH 44136	238-7663	
152.	N4OSD	T	Chuck Sommer	4560 Park Edge Dr.	Fairview Park, OH 44126	734-9696	
153.	WD8OYO	A	Dave Ernest	4223 Columbia Rd.	North Olmsted, OH 44070	777-3694	
154.	WD8PAQ	A	Bob Gromen	17800 Marks Rd.	Columbia Sta., OH 44028	238-0977	
155.	KA8PEF	G	Joe Liszeski	8233 Avon Belden Rd.	N. Ridgeville, OH 44039	1-327-7938	UL
156.	W8PEV	G	Jim Malone	31235 Avon Rd.	Westlake, OH 44145	835-1206	UL
157.	WA8PJK	G	Paul Kohanski	1146 E. 76th St.	Cleveland, OH 44103-2004	391-0241	
158.	K8PPZ	A	Tom Wisnor	27869 Sherwood Dr.	Westlake, OH, OH 44145	835-2288	

159.	W8PSX	G	Jim Mackner	P O Box 341	Avon Lake, OH 44012	-	
160.	WD8QAC	A	Al Dalgleish	26919 Westwood Ln.	Olmsted Falls, OH 44138	235-3771	
161.	K8QNK	A	Dick Scheuering	4867 Summerlane	Brooklyn, OH 44144	741-7121	
162.	KA8QOQ	G	Larry Kominek	20349 Marian Ln.	Rocky River, OH 44116	333-9943	
163.	K8RBV	A	Bob Morgan	376 East 329th St.	Willowick, OH 44094	943-6374	
164.	WD8RBX	E	Zen Bartosik	6305 Meadowbrook Ave.	Cleveland, OH 44144	398-7542	UL
165.	WB8RGK	G	Tim O'Reilly	5515 Thornton Dr.	Parma, OH 44129	888-5618	
166.*	KA8RKI	N	Tami Adams	11400 Linnet Ave.	Cleveland, OH 44111	251-3080	
167.	K8RSH	A	Chuck Early	5943 Burns Rd.	North Olmsted, OH 44070	777-1595	
168.	K8RWR	T	John Pearl Jr.	5709 Northcliff Ave.	Cleveland, OH 44144	749-0759	
169.	K8RZP	G	John Pastor	322 Berea St.	Berea, OH 44017	234-4299	
170.	K8SCI	A	Rick Wells	5955 Burns Rd.	North Olmsted, OH 44070	779-8999	
171.	WD8SDP	T	Lin Shaw	7780 Lewis Rd.	Olmsted Falls, OH 44138	235-3912	
172.*	KA8SLX	T	Chris Tetzlaff	5341 Cornell Ave.	N. Ridgeville, OH 44039	1-327-6020	
173.	WA8SNI	G	Charlie Kontras	13709 Wainstead Ave.	Cleveland, OH 44111	252-2367	
174.*	KA8SNM	T	Cheri Collins	35400 Euclid Ave. #A-204	Willoughby, OH 44094	951-9360	
175.	K9SSL	E	Mike Walker	1204 Tulip Ct.	Brunswick, OH 44212	225-1744	UL
176.	KA8SYT	T	John Sopko	2100 Hancock St.	Lorain, OH 44052	1-288-0390	UL
177.	NR8T	E	Tim Hitesman	356 Bradley Rd.	Bay Village, OH 44140	871-3055	UL
178.*	KA8THY	N	Edna Lorenz	P O Box 147	Clinton, OH 44216	1-882-3315	
179.*	K8TKQ	T	Howard Wells	5955 Burns Rd.	North Olmsted, OH 44070	779-8999	
180.	WA8TMK	E	Fred Helwig Jr.	26045 Akins Rd.	Columbia Sta., OH 44028	236-3477	
181.	KA8TQR	G	Dennis Minnick	1700 Brookdale Ave.	Parma, OH 44134	749-2365	
182.	KB8TT	A	Dave Curry	887 E. 331st St.	Eastlake, OH 44094	942-5030	UL
183.	K8TTZ	A	Bob Mills	6716 Bonna Ave.	Cleveland, OH 44103	431-9492	
184.	WB8UDA	A	Fred S. Szabo	6142 Eavenson	Brook Park, OH 44142	-	UL
185.	KA8UFN	T	Ollie Bell-Bey	13513 Cranwood Park Blvd.	Garfield Hts., OH 44125-1822	475-7886	
186.	K8UHX	A	J D Csicsila	146 River Rd.	Hinckley, OH 44233	278-7904	
187.	K8UID	G	Ron Diehl	40171 Jones Rd.	Wellington, OH 44090	1-647-3664	
188.	W8UNB	E	Mel Nelson	23576 David Dr. #2	North Olmsted, OH 44070	734-3723	
189.	WB8UPA	A	Russ Saepic	1861 Frost Circle	Brunswick, OH 44212	-	UL
190.	K8UTE	T	Basil L. Andrejko	19307 Maplewood St.	Cleveland, OH 44135	267-3433	
191.	WB8UWK	G	Steve Butler	29041 Norman Ave.	Wickliffe, OH 44092	944-2577	
192.	WA8VDG	E	Bill Berndsen	24213 Gessner Rd.	North Olmsted, OH 44070	779-0504	UL
193.	KA8VDU	T	Al Prinz	1743 Lares Lane	Brunswick, OH 44212	273-1914	
194.	K8VJG	A	Ron Borkey Sr.	10699 Ridge Rd.	North Royalton, OH 44133	237-6718	
195.	KA8VYN	G	Steve Elder	18317 Walnut Dr.	Strongsville, OH 44136	238-9319	
196.	KA8WAR	T	Joe Kluha	12954 Sprague Rd.	Parma, OH 44130	888-4617	
197.	KA8WCK	G	Roy Glassco	4503 Azalea Lane	North Olmsted, OH 44070	779-1262	
198.	KA8WHK	T	Ralph Scott	5965 Olive St.	North Ridgeville, OH 44039	1-327-0037	UL
199.	KA8WJH	A	Joe Walker	3116 Becket Rd.	Cleveland, OH 44120	491-8040	
200.	K8WNE	G	George Vivian	25190 Deerfield Dr.	North Olmsted, OH 44070	777-6039	
201.	W8WXR	A	Roger Burgess	441 Bradley Rd.	Bay Village, OH 44140	835-8739	
202.	AE8X	E	Jim Hartland	6506 Gilbert Ave.	Parma, OH 44129	842-4137	
203.	AJ8Y	E	Dennis Chaney	27697 Bryandale	Westlake, OH 44145	871-4685	
204.	AK8Y	E	Mike Cauley	3802 Bramblewood	Brunswick, OH 44212	225-7438	
205.	KA8Y	E	Shirley Lantz	12745 Vincent Dr.	Mantua, OH 44255	562-5858	
206.	KW9Y	E	Don Hilderman	596 Canterbury Rd.	Bay Village, OH 44140	871-6024	
207.*	KA8YEA	N	Eileen Neubeck	3289 W. 41 St.	Cleveland, OH 44109	631-6087	UL
208.*	KD8YM	A	Mike Willemin	331 Courtland St.	Elyria, OH 44035	1-324-4574	
209.	WB8YNX	A	Clyde Lorenz	P O Box 147	Clinton, OH 44216	1-882-3315	
210.	KA8YQL	N	Dave Freeman	4008 West 204 St.	Fairview Park, OH 44126	333-4008	UL
211.	NB8Z	E	Larry Ferrone	2531 Canterbury Rd.	Westlake, OH 44145	835-9428	
212.	KB8ZA	A	Jim Baird	3110 Klusner Ave.	Parma, OH 44134	843-2442	

213.*	KA8ZEP	T	Ann Wadsworth	11028 Hawke Rd.	Columbia Station, OH 44028	1-748-2816	
214.	KD8ZK	A	Ed Zorn	4878 Autumn Ln.	Brooklyn, OH 44144	741-9174	
215.	KA8ZLT	A	Evan Wieder	1231 Ranchland Dr.	Mayfield Hts., OH 44124	442-1784	
216.	KA8ZRF	T	Jack Nilsson	6302 Ridgewood Ave.	Parma, OH 44129	-	UL
217.	KA8ZRG	T	David Hoffmann	30015 Sequoia Trail	Westlake, OH 44145	835-8275	
218.	KA8ZRH	G	Edward Milliron	4009 Carlyle Ave.	Cleveland, OH 44109	651-8191	UL
219.	KA8ZTY	T	George Rybicki	10791 Creek Moss Ln.	Strongsville, OH 44136	238-0121	
220.*	KA8ZUA	T	Kathy Hitesman	356 Bradley Rd.	Bay Village, OH 44140	871-3055	UL
221.	KA8ZUB	N	Paula Noaker	115 S. Rocky River Dr #603	Berea, OH 44017	826-3739	UL
222.*	KA8ZUC	T	Diane Nilsson	6302 Ridgewood Ave	Parma, OH 44129	-	UL
223.	WB8ZUR	G	John Hamley	4845 Columbia Rd. #102	North Olmsted, OH 44070	779-6428	
224.*	KA8ZVK	T	Merilee Nestor	39114 Route 303	Grafton, OH 44044	1-355-8697	
225.*	KA8ZVV	N	Mary Wolf	27132 Butternut Ridge Rd.	North Olmsted, OH 44070	777-1177	
226.*	KA8ZVW	N	Gene Wells	5955 Burns Rd.	North Olmsted, OH 44070	779-8999	
227.*	KA8ZVX	T	Jason Hitesman	356 Bradley Rd.	Bay Village, OH 44140	871-3055	UL
228.*	-		Donna Pearl	5709 Northcliff Ave.	Cleveland, OH 44144	749-0759	
229.*	-		Tina Stroh	917 Salem Ave.	Elyria, OH 44035	1-365-2793	
230.*	-		Tim Sull	230 Moore Rd.	Avon Lake, OH 44012	1-933-4582	
231.*	-		Michele Tews	3341 W. 131 St.	Cleveland, OH 44111	476-8164	
232.	-		Richard Volker	29871 Cambridge	North Olmsted, OH 44070	779-5911	
233.*	-		Pennie Wells	5955 Burns Rd.	North Olmsted, OH 44070	779-8999	

* Denotes Family Member

Please let Rick K8SCI or Pauline KA8FOE know of any corrections or changes in your address information, or changes in your callsign or class of license as soon as possible.

North Coast Amateur Radio Club - MINI ROSTER - Jun 14, 1987

CALL	NAME	CALL	NAME	CALL	NAME	CALL	NAME	CALL	NAME
KB8-A	DAN	K8-DBN	BILL	N8-HTX	MONICA	NQ8-O	TOM	KA8-WCK	ROY
K8-AAI	BOB	K8-DDY	BILL	N8-HUR	CARL	WD8-OCI	BOB	KA8-WHK	RALPH
W8-ADV	RAY	KE8-DJ	DIANE	N8-HVQ	JACK	WD8-OMW	GLENN	KA8-WJH	JOE
WL7-AEC	TOM	N8-DMK	RUSS	N8-HWK	LARRY	K8-OPV	GEORGE	K8-WNE	GEORGE
N9-AGC	GREG	N8-DPZ	BOB	N8-HWP	EVELYN	N4-OSD	CHUCK	W8-WXR	ROGER
KB8-AII	PAT	K8-DTS	BOB	N8-IAA	LARRY	WD8-OYO	DAVE	AE8-X	JIM
WD8-AJF	DAN	WB8-DTY	TOMMIE	N8-IAN	TOM	WD8-PAQ	BOB	AJ8-Y	DENNIS
KB8-AK	PAT	KE8-DX	DICK	N8-IAR	BOB	KA8-PEF	JOE	AK8-Y	MIKE
N8-API	GEORGE	WA8-DYL	GENE	N8-IAX	CODY	W8-PEV	JIM	KA8-Y	SHIRLEY
N8-ATV	JERRY	KB8-DZ	JOE	N8-IAZ	TERRY	WA8-PJK	PAUL	KW9-Y	DON
N8-AUH	DAVE	N8-DZO	JACK	N8-ICD	CLIFF	K8-PPZ	TOM	KA8-YEA	EILEEN
K8-AZ	TOM	W8-EFW	PAUL	W3-IGI	BILL	W8-PSX	JIM	KD8-YM	MIKE
WA8-AZO	JOE	N8-EIJ	KEN	W7-IJ	BILL	WD8-QAC	AL	WB8-YNX	CLYDE
KK8-B	DENNY	W8-EPM	JOE	N8-ILL	MARY LOU	K8-QNK	DICK	KA8-YQL	DAVE
KB8-BBU	JERRY	KD8-EQ	DICK	WA8-IMO	BOB	KA8-QOQ	LARRY	NB8-Z	LARRY
W1-BBW	SHELLY	WA8-ERA	LEE	KA8-IMU	TONY	K8-RBV	BOB	KB8-ZA	JIM
KB8-BBZ	ED	W8-ETC	LEN	WD8-INK	KEN	WD8-RBX	ZEN	KA8-ZEP	ANN
KB8-BDY	NICK	N8-ETP	TOM	WD8-INO	STEVE	WB8-RGK	TIM	KD8-ZK	ED
KB8-BEB	RON	N8-ETQ	DAN	W8-IO	BOB	KA8-RKI	TAMI	KA8-ZLT	EVAN
K8-BJA	RICH	N8-ETW	ERNIE	WD8-IQO	MILT	K8-RSH	CHUCK	KA8-ZRF	JACK
KA8-BJA	FRANK	N8-ETY	DAVE	WD8-IRG	VAN	K8-RWR	JOHN	KA8-ZRG	DAVE
W1-BKZ	PETE	N8-ETZ	MARY	WD8-ISB	DICK	K8-RZP	JOHN	KA8-ZRH	ED
KE8-BN	MARK	KA8-EVS	CHARLIE	KR0-J	JEFF	K8-SCI	RICK	KA8-ZTY	GEORGE
KB8-BNC	RON	KD8-EX	TOM	N6-JAM	RON	WD8-SDP	LIN	KA8-ZUA	KATHY
N8-BO	CHARLIE	KC8-F	HEINZ	WD8-JMM	AL	KA8-SLX	CHRIS	KA8-ZUB	PAULA
WB8-BPA	DON	W8-FAZ	JOE	KD8-JQ	DON	WA8-SNI	CHARLIE	KA8-ZUC	DIANE
KB8-BPR	PATRICIA	N8-FCX	RON	W8-KBV	JOE	KA8-SNM	CHERI	WB8-ZUR	JOHN
KA8-BPU	RAY	N8-FDY	TOM	W8-KGA	LARRY	K9-SSL	MIKE	KA8-ZVK	MERILEE
KB8-BSC	JOHN	N8-FEG	PETE	WD8-KHU	MARK	KA8-SYT	JOHN	KA8-ZVV	MARY
N8-BTB	STEVE	N8-FGR	WAYNE	KC8-KI	JOHN	NR8-T	TIM	KA8-ZVW	GENE
K8-BVI	ART	N8-FIL	RICH	WD8-KTC	MARIE	KA8-THY	EDNA	KA8-ZVX	JASON
N8-BYW	BUD	N8-FKS	DON	KA8-LIH	KAREN	K8-TKQ	HOWARD	- DONNA PEARL	
AE8-C	SY	N8-FKT	BOB	N8-LL	JIM	WA8-TMK	FRED	- TINA STROH	
W8-CDL	DAVE	KA8-FOE	PAULINE	WD8-LRZ	LARRY	KA8-TQR	DENNIS	- TIM SULL	
W8-CEJ	MEL	WA8-FOV	TED	W8-LWY	JOHN	KB8-TT	DAVE	- MICHELE TEWS	
W8-CEM	CHUCK	N8-FQQ	TOM	AI8-M	DAVE	K8-TTZ	BOB	- RICH VOLKER	
W8-CHA	STEVE	N8-GJR	JIM	KV8-M	TOM	WB8-UDA	FRED	- PENNIE WELLS	
WD8-CHL	JIM	WB9-GMO	MIKE	NO8-M	STEVE	KA8-UFN	OLLIE		
KB8-CI	TOM	W8-GNB	EDDIE	K8-MBZ	DAVE	K8-UHX	J D		
KB8-CJQ	STARRETT	N8-GNJ	STEVE	K8-MDC	FRED	K8-UID	RON		
N8-CKV	PAUL	N8-GNL	JOHN	K8-MGH	LOU	W8-UNB	MEL		
KA8-CKZ	BILL	HR3-GS	GLADIS	WD8-MHL	RAY	WB8-UPA	RUSS		
N8-CQD	BILL	WA8-GZC	MARION	WD8-MHR	ERIC	K8-UTE	BASIL		
KE8-CT	PETE	N8-HAD	SKIP	K8-MO	JEFF	WB8-UWK	STEVE		
WA8-CTU	AL	N8-HHE	ROB	W8-MW	MAYNARD	WA8-VDG	BILL		
K8-CVZ	ED	N8-HJJ	JIM	WB8-NAQ	BILL	KA8-VDU	AL		
W8-CWT	KEN	N8-HOB	PAUL	KB8-NW	TEDD	K8-VJG	RON		
N8-DAD	BARB	N8-HPV	ELIZABETH	WA8-NXT	FERD	KA8-VYN	STEVE		
K8-DBG	DICK	N8-HSE	NAN	WB8-NXT	NEIL	KA8-WAR	JOE		

NORTH COAST AMATEUR RADIO CLUB, P.O. Box 30529, Cleveland, Ohio 44130

Membership Application / Renewal Information

A. ____ **INDIVIDUAL MEMBERSHIP** - - $12.00 annually (July 1 thru June 30).
(New members may prorate at $1.00 per month)

Date:__________ Call:____________ Class: - / N / T / G / A / E Expires:____________

Name:____________________ Ph:____________ Unlisted? Y - N OK on roster? Y - N

Address:____ Apartment__________

City:______________________________ State:________ ZIP:________-________

Your preferred First Name (Handle) to be shown on the NCARC Roster:______________

ARRL member?: Y - N - Life ARRL membership expires:______________

B. ____ **FAMILY MEMBER/S** - - $1.00 annually each (July 1 thru June 30).

Name:______________ Call:__________ Class: - / N / T / G / A / E Expires:________
ARRL member?: Y - N - Life ARRL membership expires:____________

Name:______________ Call:__________ Class: - / N / T / G / A / E Expires:________
ARRL member?: Y - N - Life ARRL membership expires:____________

Name:______________ Call:__________ Class: - / N / T / G / A / E Expires:________
ARRL member?: Y - N - Life ARRL membership expires:____________

YOUR INTERESTS - Please indicate (with a circle) areas you are active in:

HF/QTH: 160/80/40/30/20/15/12/10/10FM HF/Mobile: 160/80/40/30/20/15/12/10/10FM
VHF-UHF(FM)/QTH: 50/144/220/440/above VHF-UHF(FM)/Mobile: 50/144/220/440/above
VHF-UHF(CW-SSB)/QTH: 50/144/220/432 VHF-UHF(CW-SSB)/Mobile: 50/144/220/432
Contests Traffic DX CW Hi-Speed/CW SSB RTTY ATV HF-Packet VHF-Packet
AMATOR Repeater Education/Instruction: Morse-Code Theory Net Control Field Day
Public Service? Y - N Satellite: OSCAR__________ RS______ Other__________
HT/Portable equipment: FM 144/220/440 Other:____________________
Emergency Standby Power? Y - N For what equipment?____________________
Computer - Type(s):______________________________
Amateur Radio uses:______________________________
Other - ______________________________

____

NORTH COAST AMATEUR RADIO CLUB - 1987 CALENDAR YEAR

OFFICERS

President - - -	Tim Hitesman	NR8T	871-3055
V. President -	Bob Mills	K8TTZ	431-9492
Treasurer - - -	Jim Nestor	N8GJR	1-355-8697
Secretary - - -	Dave Hoffmann	KA8ZRG	835-8275

POSITIONS

ARRL Club Liaison-	Rick	K8SCI	779-8999
ARRL VE Liaison -	Dan	KB8A	267-5083
Awards - - - - - -	Fred	WB8UDA	U.L.
Contest - - - - -	Dave	KB8TT	942-5030
Editor - - - - - -	Rick	K8SCI	779-8999
Education -			
Event Complier - -	Ed	KA8ZRH	651-8191
Field Day - - - -	KB8BEB, WD8MHL and K8SCI		
Finance - - - - -	Mike	K9SSL	225-1744
Membership - - - -	Pauline	KA8FOE	779-8999
NCARES - - - - - -	Rick	K8SCI	779-8999
Net Coordinator -	Steve	N8GNJ	1-365-2793
Programs -			
Public Relations -	Steve	NO8M	777-1177
Refreshments - - -	Pauline	KA8FOE	779-8999
Sunshine - - - - -	Pauline	KA8FOE	779-8999
Technical - - - -	Tom	N8FQQ	251-3080

TRUSTEES

Dan - - -	N8ETQ	845-5442
Tom - - -	KD8EX	1-933-8753
Pauline -	KA8FOE	779-8999
Steve - -	N8GNJ	1-365-2793
Dick - -	WD8ISB	467-7733
Steve - -	WD8INO	741-2547
Steve - -	NO8M	777-1177
Ray - - -	WD8MHL	671-0317
Rick - -	K8SCI	779-8999

VOLUNTEER EXAMINERS

Dan - - -	KB8A	267-5083
Dan - - -	WD8AJF	1-748-2816
Pete - -	W1BKZ	951-9360
Dick - -	KD8EQ	235-2323
Heinz - -	KC8F	734-6890
Bob - - -	W8IO	734-0570
Dick - -	WD8ISB	467-7733
Don - - -	KD8JQ	1-723-5492
Dave - -	AI8M	1-324-4574
Steve - -	NO8M	777-1177
Mike - -	K9SSL	225-1744
Tim - - -	NR8T	871-3055
Shirley -	KA8Y	562-5858

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